SONY

DIGITAL VIDEOCASSETTE RECORDER

DNW-A28
DNW-A28P

BETACAM SX

MAINTENANCE MANUAL
Volume 1 1st Edition
Serial No. 10001 and Higher: DNW-A28
Serial No. 40001 and Higher: DNW-A28P

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

Attention-when the product is installed in Rack:

1. **Prevention against overloading of branch circuit**
   When this product is installed in a rack and is supplied power from an outlet on the rack, please make sure that the rack does not overload the supply circuit.

2. **Providing protective earth**
   When this product is installed in a rack and is supplied power from an outlet on the rack, please confirm that the outlet is provided with a suitable protective earth connection.

3. **Internal air ambient temperature of the rack**
   When this product is installed in a rack, please make sure that the internal air ambient temperature of the rack is within the specified limit of this product.

4. **Prevention against achieving hazardous condition due to uneven mechanical loading**
   When this product is installed in a rack, please make sure that the rack does not achieve hazardous condition due to uneven mechanical loading.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

ADVARSEL!

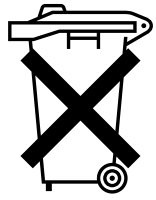
Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

Voor de klanten in Nederland

Dit apparaat bevat een $(CF)_n$-Li batterij voor memory back-up.

Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat bij einde levensduur afdankt.

Gooi de batterij niet weg. maar lever hem in als KCA.



Bij dit produkt zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.

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Appendix A Setting Check Sheet

Manual Structure

Purpose of this manual

This manual is the Maintenance manual volume 1 of digital videocassette recorder DNW-A28/A28P.

This maintenance manual (Volume 1 and 2) is intended for use by trained system and service engineers, and provides the information of maintenance and detailed service (parts replacement, guideline for adjustment, schematic diagrams, board layouts, detailed parts list).

This manual (volume 1) explains about maintenance information, parts replacement, and guideline for adjustment.

Related manuals

Besides this “Maintenance manual”, the following manuals are available for digital videocassette recorder DNW-A28/A28P.

- **Operation Manual (Supplied with the DNW-A28/A28P.)**
  This manual is necessary for application and operation (and installation) of the DNW-A28/A28P.

- **Installation Manual (Supplied with the DNW-A28/A28P.)**
  This manual describes the information on installing the DNW-A28/28P.

- **Protocol Manual of Remote (9-pin) Connector (available on request)**
  This manual explains the protocol for controlling the VTR via the RS-422A (9-pin serial remote) . If this manual is required, please contact your local Sony Sales Office/Service Center.

- **“Semiconductor Pin Assignments” CD-ROM (Available on request)**
  This “Semiconductor Pin Assignments” CD-ROM allows you to search for semiconductors used in Broadcasting & Professional Systems Company equipment.
  Semiconductors that cannot be searched for on this CD-ROM are listed in the maintenance manual for the corresponding unit. The maintenance manual contains a complete list of all semiconductors and their ID Nos., and thus should be used together with the CD-ROM.
  Part number: 9-968-546-XX

Contents

This maintenance manual (volume 1 and volume 2) is organized by following sections.

Maintenance manual volume 1 (9-967-866-)

Section 1 Service Overview

Explains the information that is required to service (removal of cabinet and cassette compartment, the functions of printed circuit board, the locations of main part, fixture and measuring equipment information, board extension, NV-RAM/EE-PROM, etc.).

Section 2 Error Messages

Explains the error massages.

Section 3 Maintenance Mode

Explains each menu of the maintenance mode.

Section 4 Periodic Maintenance and Inspection

Explains the recommended periodic maintenance, the cleaning procedure and the video head tip protrusion check procedure.

Section 5 Periodic Maintenance Parts Replacement

Explains the replacement of periodic maintenance parts and overview for replacement of mechanical parts.

Section 6 Main Parts Replacement

Explains the replacement of mechanical parts (except periodic maintenance parts) and circuit boards.

Section 7 Tape Path Alignment

Explains the tape path alignment after replacement of parts that are described in Section 5 and Section 6.

Section 8 Electrical Alignment after Drum Replacement

Explains the electrical alignment associated with replacement of drum.

Section 9 Electrical Alignment

Explains the electrical alignment for the maintenance of this unit.

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Maintenance manual volume 2 (9-967-867-)

Section 1 Semiconductor Pin Assignments

This section contains information on semiconductors used for unit.
It includes a complete list of the semiconductors and their ID Nos. for retrieving information on “Semiconductor Pin Assignments” CD-ROM, which is available separately.
Please refer to this section together with the “Semiconductor Pin Assignments” CD-ROM.
Information on the semiconductors not contained in the CD-ROM at the time of issue of this manual, if any, is given in this section as well.

Section 2 Spare Parts

Describes the exploded views, the mechanical parts list and the electrical parts list.

Section 3 Circuit Description and Block Diagrams

Describes the circuit description and the block diagrams of overall and each board.

Section 4 Schematic Diagrams

Describes the frame wiring and the schematic diagrams for the unit.

Section 5 Board Layouts

Describes the board layouts for the unit.

Trademark

Trademark used in this manual is as follows:

• Dolby is registered trademark of Dolby Laboratories Licensing Corporation.

Section 1
Service Overview

1-1. Notes on Maintenance Service

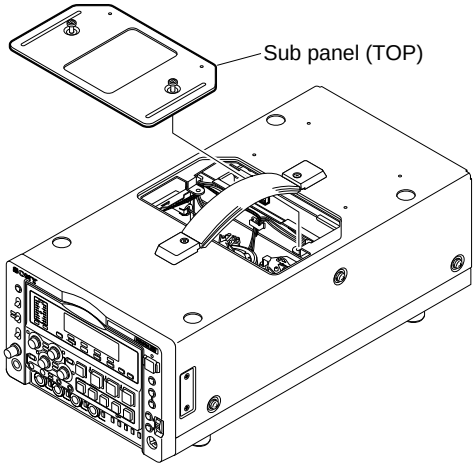
1. DNW-A28 is designed as a compact size, therefore it is suitable for mount on the Outside Broadcasting ban. To prevent the loosening the screw depends on the vibration of driving the Outside Broadcasting ban, the screw should be tightened as the following tightening torque using the torque screwdriver.
   It is recommended to use the specified torque screwdriver prepared as the tool for M1.4 and M2 screws.

   - For M1.4 screw: 9×10^{-2} N•m {0.9 kgf•cm}
   - For M2 screw: 20×10^{-2} N•m {2.0 kgf•cm}
   - For M2.6 screw: 5×10^{-2} N•m {5.0 kgf•cm}
   - For M3 screw: 8×10^{-2} N•m {8.0 kgf•cm}
   - For M4 screw: 14×10^{-2} N•m {14.0 kgf•cm}

   Notes
   - Torque screwdriver bit (for M1.4): J-6325-110-A
   - Torque screwdriver bit (for M2): J-6325-380-A
   - Hexagon bit (for torque driver): J-6326-120-A
   - Torque screwdriver (3 kgf•cm): J-6325-400-A

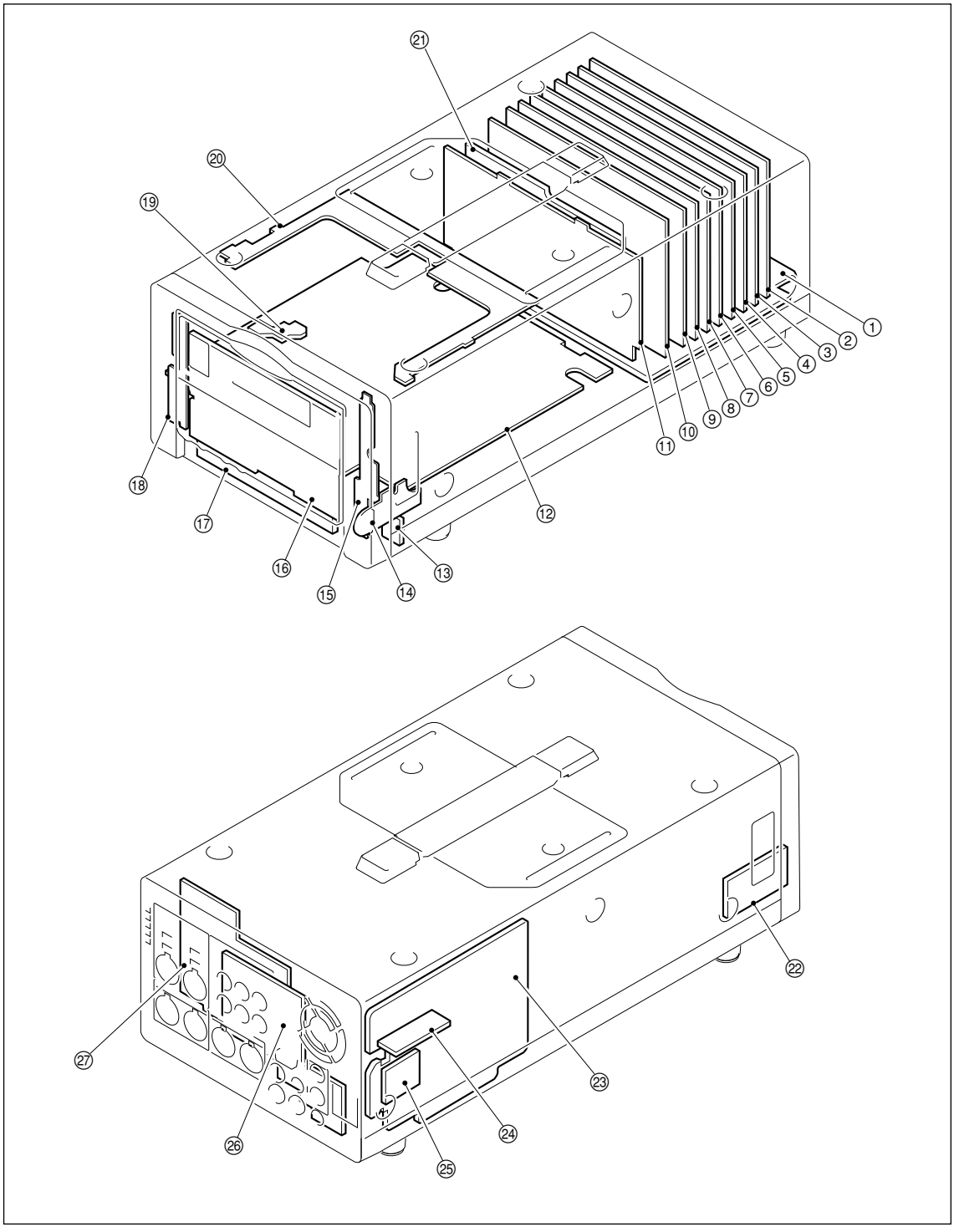
2. The display of the front panel is also designed as a compact size.
   When the setup menu and maintenance mode are performed during the service operation, it is recommended to connect the video monitor to the VIDEO OUTPUT 2 (SUPER) connector on the connector panel. The item and data of the setup menu and maintenance mode are displayed on the video monitor in detail to help your service operation.

3. The design of this unit is improved in serviceability, then the following service operation can be performed easily by removing the sub panel (TOP) on the top of the unit using a coin or similar object.
   - Cleaning of upper drum
   - Cleaning of some tape guide
   - Ejecting of cassette tape using the manual eject gear



1-2. Location of Main Parts and Circuit Function

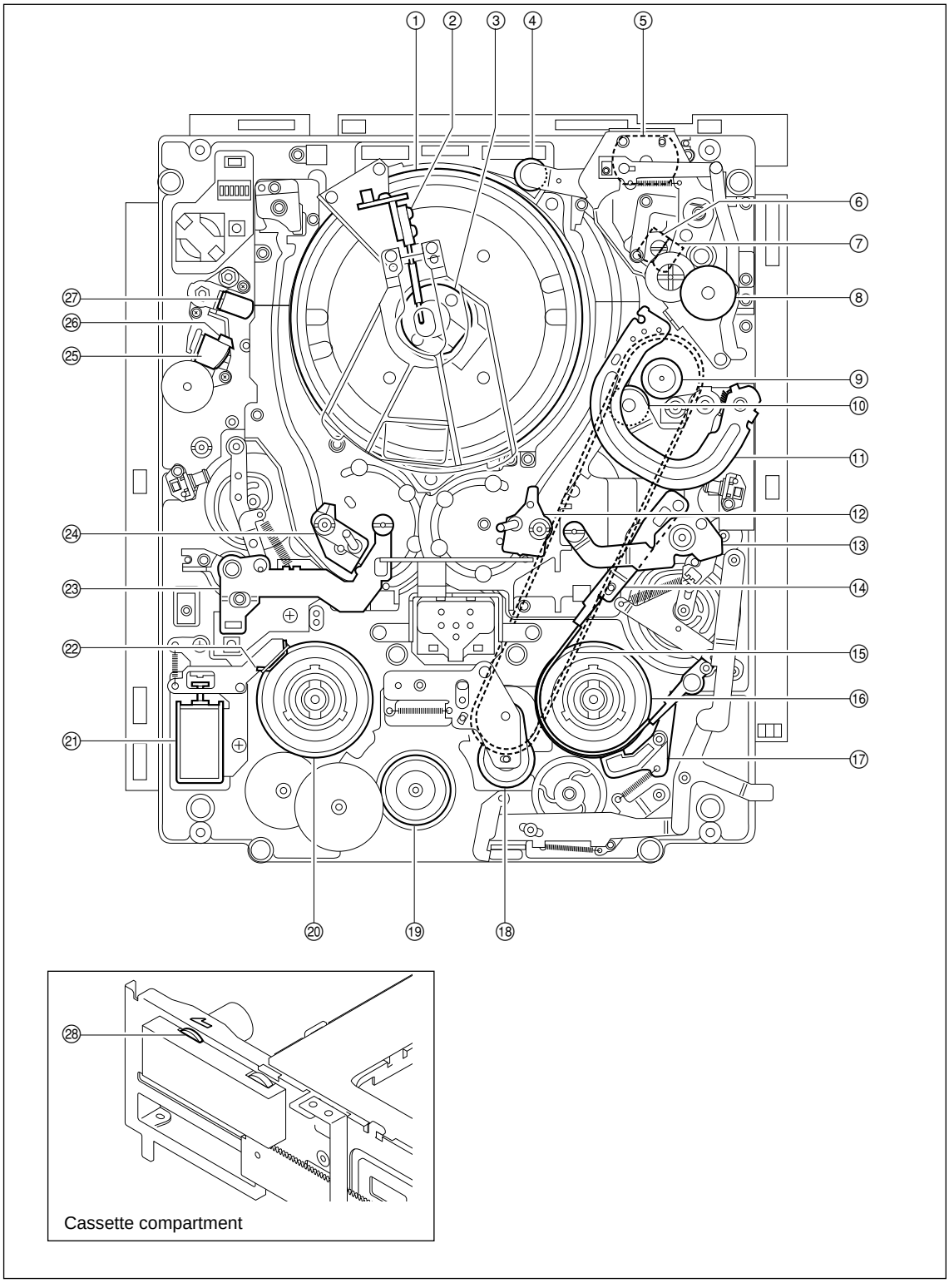
1-2-1. Function and Location of Printed Circuit Boards



System	Board	Circuit Function	Fig.
Digital processing	DPR-87	Digital data processor Video BRR* encoder/decoder, ECC** encoder/decoder(Outer error correction)	⑧
	SDI-23	4:2:2 component serial digital interface	⑤
Video processing	VPR-34	Video signal processor Video process D-A, Composite encoder	⑦
	DEC-97	Analog composite decoder	④
Analog Betacam video PB processing	DM-114 (for DNW-A28) DM-114P (for DNW-A28P)	RF demodulator for analog Betacam PB, TBC***	⑭
Audio processing	APR-27A	Audio signal processor	③
	AU-249	Audio A-D (Analog CH1/2 input), Audio D-A (Analog CH1/2 output) Audio D-A (Monitor output)	②
	PA-218	Head amplifier for analog Betacam PB	㉑
RF processing	EQ-72	RF equalizer REC current control, PB EQ, Analog Betacam PB buffer Inner error correction	⑪
Timing generator	TG-191	Reference timing signal and clock generator	⑥
System control	SY-259B	System control (SYS1)	⑩
	SY-260	System control (SYS2)	⑨
Motor driver/sensor	SV-194A	Servo control, Motor driver, Sensors	⑫
	SR-65	S tension sensor	⑲
Front panel	SW-21	Lower control panel	⑰
	SW-22	Control panel (EJECT, CTL/TC/U-BIT, HOLD, RESET, SET, MENU)	⑮
	SW-23	Control panel (WARNING Indi., REC INHI, METER, MONITOR)	⑱
	CT-209	Jog dial	⑭
	VFD assembly	Display and function control	⑯
Connector panel	CP-344	Connector board (AUDIO/MONITOR system), select switch and audio amplifier (AUDIO INPUT/OUTPUT, MONITOR OUTPUT)	㉗
	CP-354	Connector board (VIDEO/REMOTE/SDI/DC/TC system), select switch and amplifier (VIDEO INPUT/OUTPUT, REMOTE, SDI IN/OUT, DC OUT, TC IN/OUT)	㉖
	DC-97	DC IN terminal board	㉕
Power	RE-150	Switching regulator	㉓
	RE-158	Breaker	㉔
Others	MB-757A	Motherboard	①
	HP-100	Headphones jack	㉒
	PSW-72	Power switch	⑬
	SE-529	Cassette compartment	⑳

*BRR: Bit Rate Reduction **ECC: Error Correction Coding ***TBC: Time Base Corrector

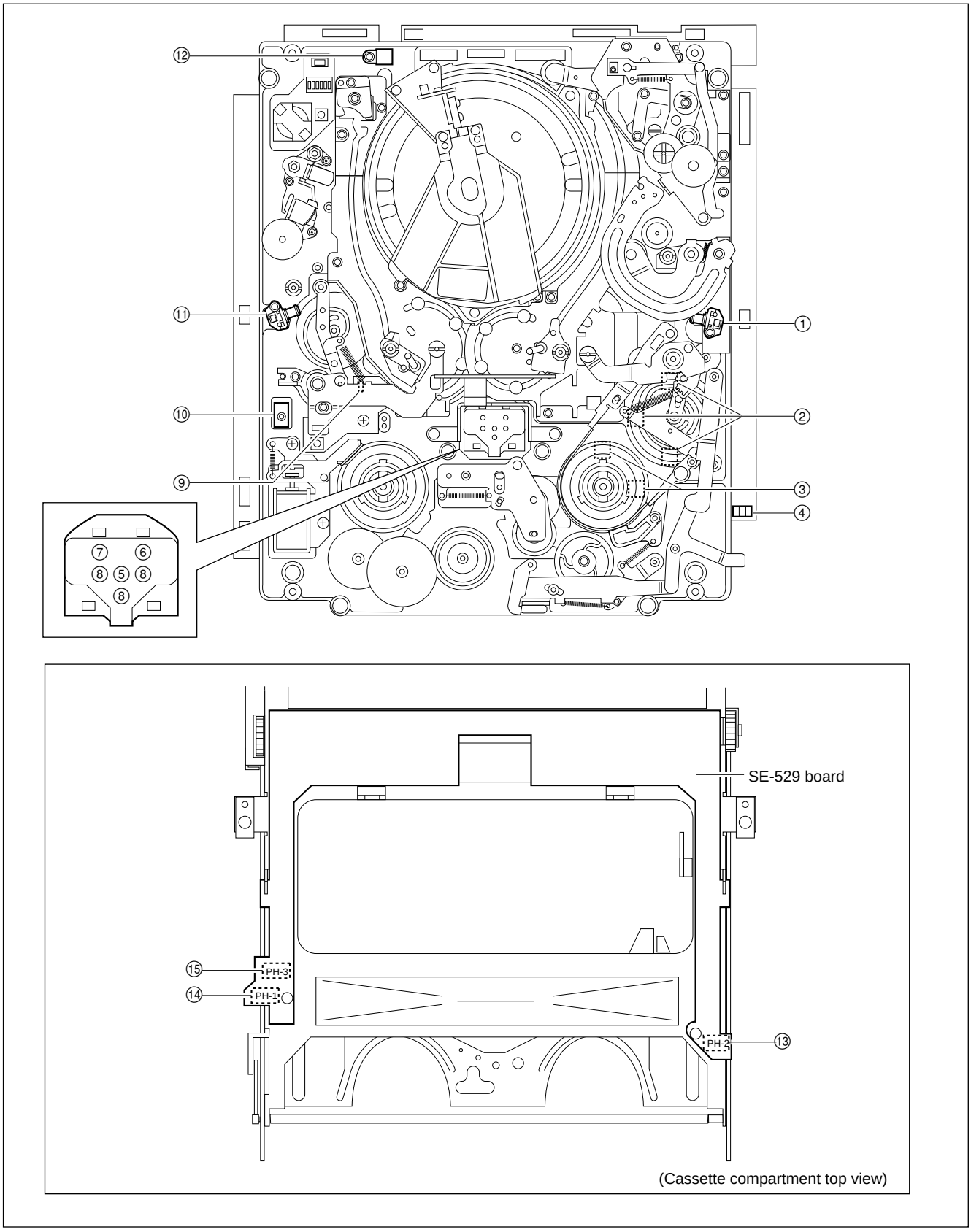
1-2-2. Location of Main Mechanical Parts



Index

① Drum assembly
② Brush
③ Slip ring
④ Video head cleaner
⑤ Threading motor
⑥ TC erase head
⑦ AT head
⑧ Manual eject knob
⑨ Capstan motor
⑩ Pinch roller
⑪ T drawer arm
⑫ T slider
⑬ T tension regulator arm
⑭ Tension regulator band
⑮ Timing belt (reel)
⑯ T reel table
⑰ T soft brake
⑱ Gear
⑲ S reel motor
⑳ S reel table
㉑ Brake solenoid
㉒ S main brake
㉓ S tension regulator arm
㉔ S slider
㉕ Full erase head
㉖ Tape cleaner
㉗ CTL head
㉘ Manual eject gear (cassette compartment up/down)

1-2-3. Function and Location of Sensors



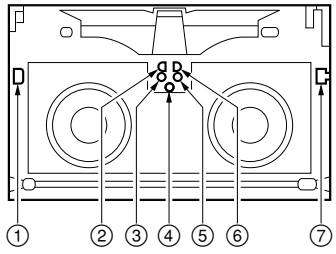
①	Tape top sensor	Detects the end of the tape running in the reverse direction.
②	Function cam sensor	Detects the rotation position of the cam.
③	T reel table FG sensor	Detects the rotation speed of the T reel table. In addition, the sensor output FG is sent to the servo circuit to calculate the diameter of wound tape and to discriminate the abnormality of the T reel table rotation.
④	Cassette compartment lock sensor	Detects whether the cassette compartment is locked or not.
⑤	Oxide/Metal sensor	Detects the metal tape detection tab of a cassette to discriminate whether the tape stored in a Betacam/Betacam SP cassette is an oxide or metal particle tape.
⑥	Tape thickness sensor	Detects the tape thickness detection tab of a cassette to discriminate the thickness of the tape stored in a cassette.
⑦	Reel hub diameter sensor	There are two kinds of hubs (thin or thick in diameter) according to the length of a tape stored in a cassette. This sensor detects the reel hub diameter detection tab of a cassette to discriminate which hub is used in a cassette. The output of the sensor is sent to the servo circuit of the S reel motor to control the reel rotation speed and torque during tape running.
⑧	Cassette classification sensors	Detect the three cassette classification detection tabs of a cassette to discriminate whether an inserted cassette can be used for the unit.
⑨	S tension regulator arm sensor	Detects the position of the S tension regulator arm. The output of the sensor is sent to the S reel motor servo circuit to control the reel torque to keep a constant S tape tension during recording and playback.
⑩	REC inhibit sensor	Detects the state of the REC inhibit plug of a cassette.
⑪	Tape end sensor	Detects the end of the tape running in the forward direction.
⑫	Condensation sensor	Detects whether the dew condensation occurs in the unit or not.
⑬	Cassette-in sensor	Detects the cassette is inserted.
⑭	Holder position sensor	Detects the position of the cassette compartment.
⑮	Cassette position sensor	Detects whether the cassette is inserted properly into the cassette compartment or not.

1-3. System of Cassette

As shown in the figure below, plugs and tabs are provided at the back side of the cassette tape.

Cassette for Betacam SX

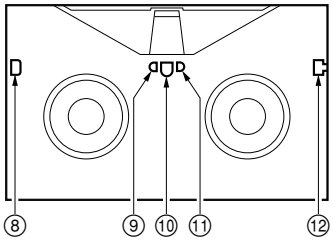
Small cassette (S cassette)



① S cassette analog REC inhibit hole
② Tape thickness detection hole
③④⑤ Cassette classification detection tabs
⑥ Reel hub diameter detection tab
⑦ S cassette digital REC inhibit plug

Cassette for Betacam or Betacam SP

Small cassette (S cassette)



⑧ S cassette REC inhibit tab (for oxide tape)
⑨ Tape thickness detection tab
⑩ Metal tape detection tab
⑪ Reel hub diameter detection tab
⑫ S cassette REC inhibit plug (for metal particle tape)

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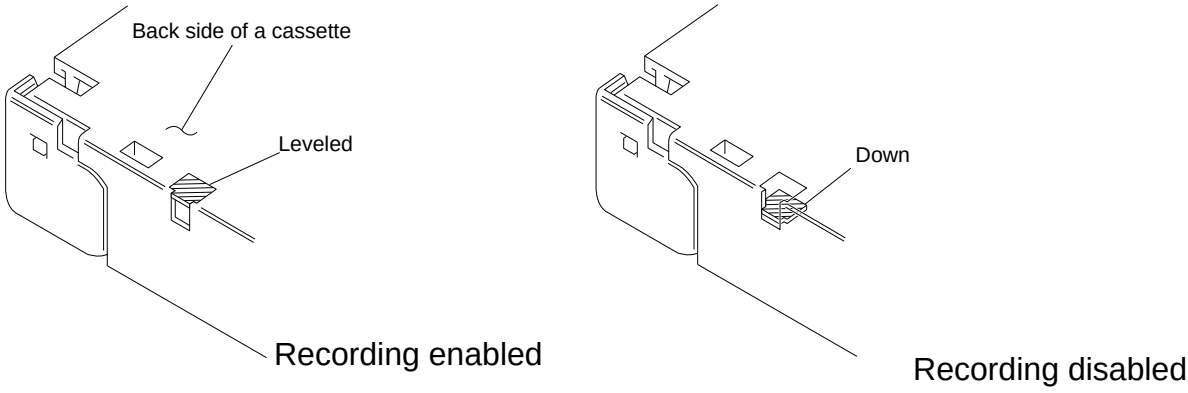
REC Inhibit Plugs



Detection Tabs

Cassette for Betacam SX

No.	Use	With tab (closed)	Without tab (opened)
②	Tape thickness detection	Thickness: 14.5 µm	Thickness: other than 14.5 µm
⑥	Reel hub diameter detection	Small hub	
③④⑤	Cassette classification detection	③ is without tab (opened) for Betacam SX cassette. Represents the cassette classification by combination of three tabs. (See below)	

Cassette for Betacam or Betacam SP

No.	Use	With tab (closed)	Without tab (opened)
②	Tape thickness detection	Thickness: 20 µm	Thickness: 15 µm
③	Metal tape detection	Oxide tape	* Metal particle tape
④	Reel hub diameter detection	Small hub	Large hub

* : For the metal particle tape, digital recording can be performed using a Betacam SX format.

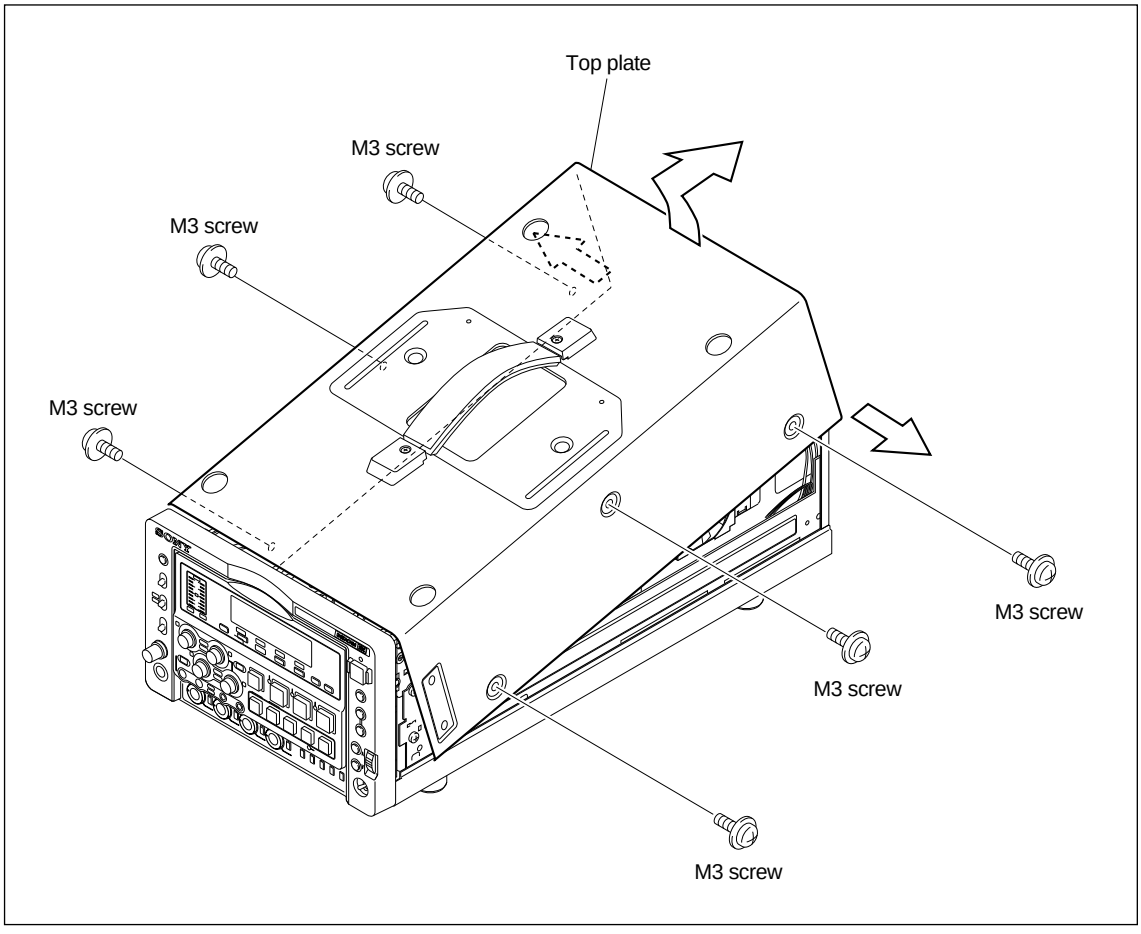
Cassette classification detection tabs ○: with tab (closed), ● : without tab (opened)

State of tabs ③⑤④	Cassette class	Remarks
○○	Betacam or Betacam SP	———
●○	Betacam SX	———
○●	Digital Betacam	Unusable
●●, ○●, ●●, ○●, ●●	Except the above class	Unusable

1-4. Removing/Reinstalling the Cabinet

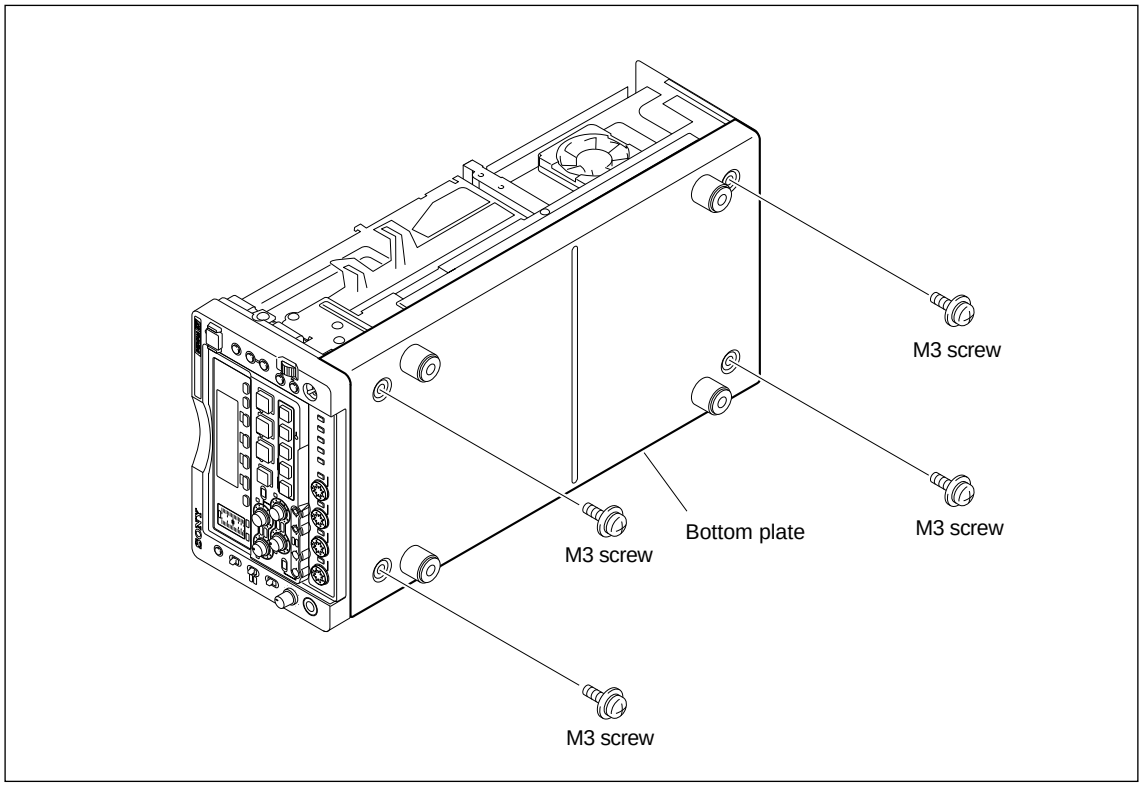
1-4-1. Top Plate

1. Remove the six screws (three each at right and left sides) securing the top plate.
2. Slightly lift up the top plate at the connector panel side, and move it in the arrow direction to remove while slightly widening the bottom of it as shown in the figure.
3. Reattach the top plate in the reverse order of steps 1 and 2.



1-4-2. Bottom Plate

1. Remove the top plate. (Refer to Section 1-4-1.)
2. Remove the four screws securing the bottom plate.
3. Remove the bottom plate.
4. Reattach the bottom plate in the reverse order of steps 1 to 3.



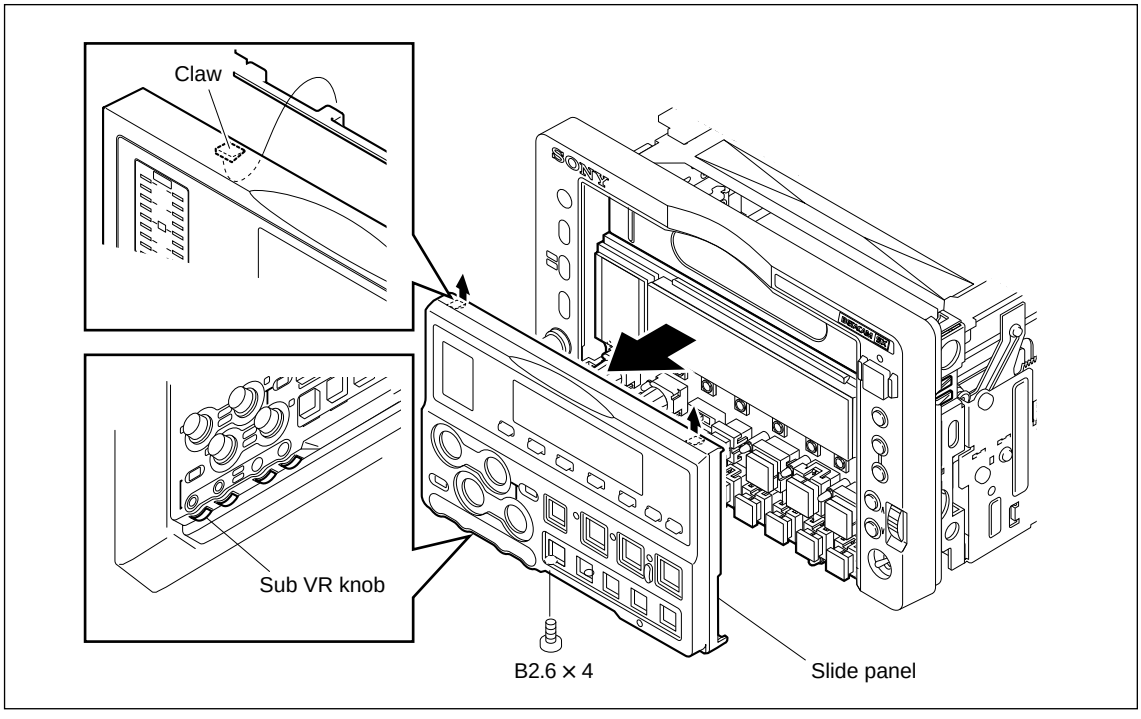
1-4-3. Slide Panel and Front Panel

Slide Panel

1. Move the slide panel downward so that the cassette tape can be inserted.
2. Remove a screw at the bottom of the slide panel.
3. Slightly lift up the upper two portions of the slide panel to disengage the claws as shown in the figure. Being careful not to obstruct the slide panel against the sub VR knob, remove the slide panel in the direction of the arrow.
4. Reattach the slide panel in the reverse order of steps 1 to 3.

Notes

- Make sure that the two claws at the top of the slide panel are surely locked to the bracket above the VFD assembly.
- After reinstalling, make sure that each button of the push switch and each knob of the slide switch are surely inserted in each hole of the slide panel.
- After reinstalling, make sure that the slide panel moves up and down smoothly.

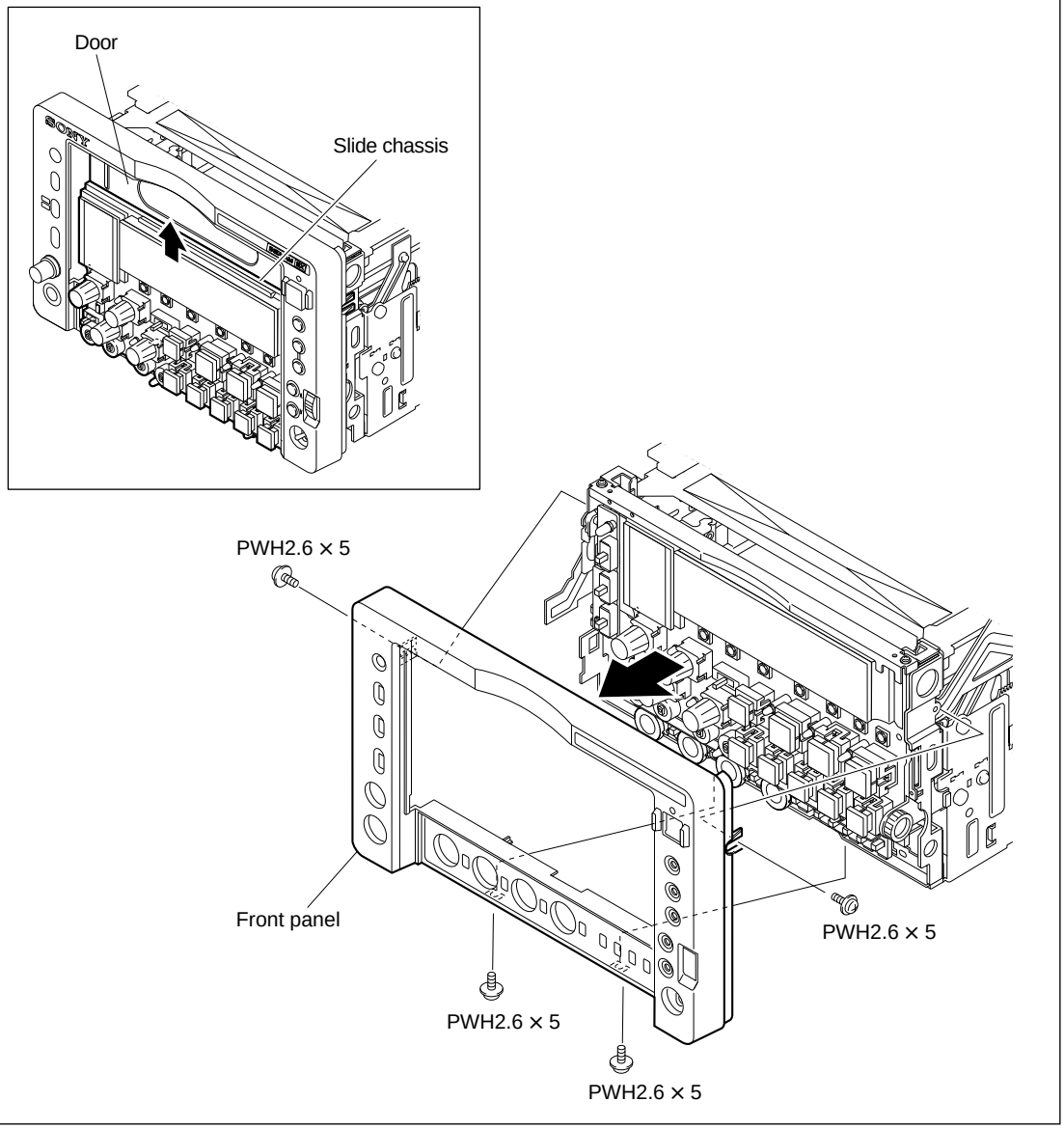


Front Panel

1. Remove the top plate. (Refer to Section 1-4-1.)
2. Remove the bottom plate. (Refer to Section 1-4-2.)
3. Remove the slide panel.
4. Remove the two screws at right and left sides of the front panel, and two screws at the bottom side.
5. Move the slide chassis upward to disappear the cassette insertion door.
6. Remove the front panel to the front.
7. Reattach the front panel in the reverse order of steps 1 to 6.

Notes

- Make sure that the two claws at the top of the slide panel are surely locked to the bracket above the VFD assembly.
- After reinstalling, make sure that each button of the push switch and each knob of the slide switch are surely inserted in each hole of the front panel and slide panel.
- After reinstalling, make sure that the slide panel moves up and down smoothly.



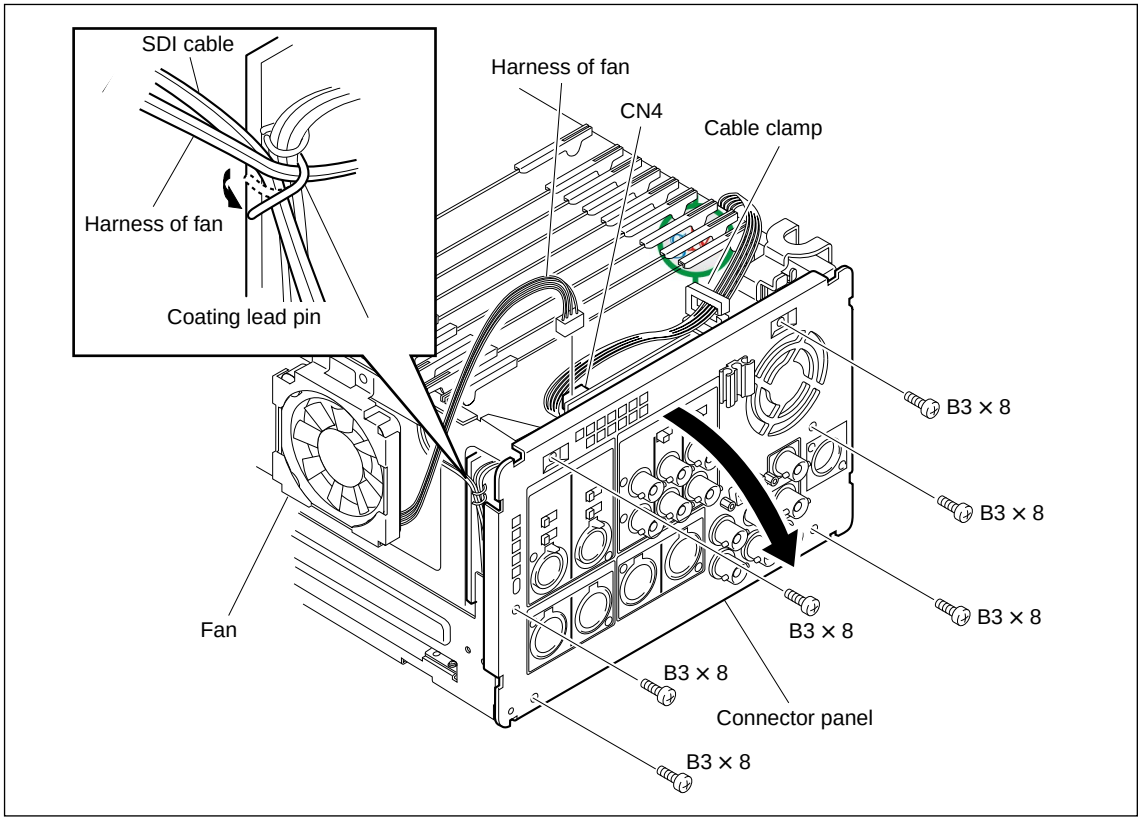
1-4-4. Connector Panel

1. Remove the top plate. (Refer to Section 1-4-1.)
2. Remove the six screws securing the connector panel.
3. Remove the fan harness from the coating lead pin which fastening the two harnesses connected to SY-259B and AU-249 boards with it.
4. Disconnect the harness connector of the fan from the connector (CN4) at the top edge of the CP-354 board.
5. Unfasten the SDI cables from the coating lead pin as shown in the figure.
6. Unfasten the two harnesses connecting to the SY-259B and AU-249 boards from the cable clamps.
7. Open the connector panel.

   Note

   If the power is turned on in this state, the fan trouble alarm occur. In this case, turn the switch S201-5 on the SY-259B board to ON to disappear the alarm display and enable the normal operation.
   After completing the service operation, be sure to turn the switch S201-5 back to OFF.

8. Reattach the connector panel in the reverse order of steps 1 to 7.

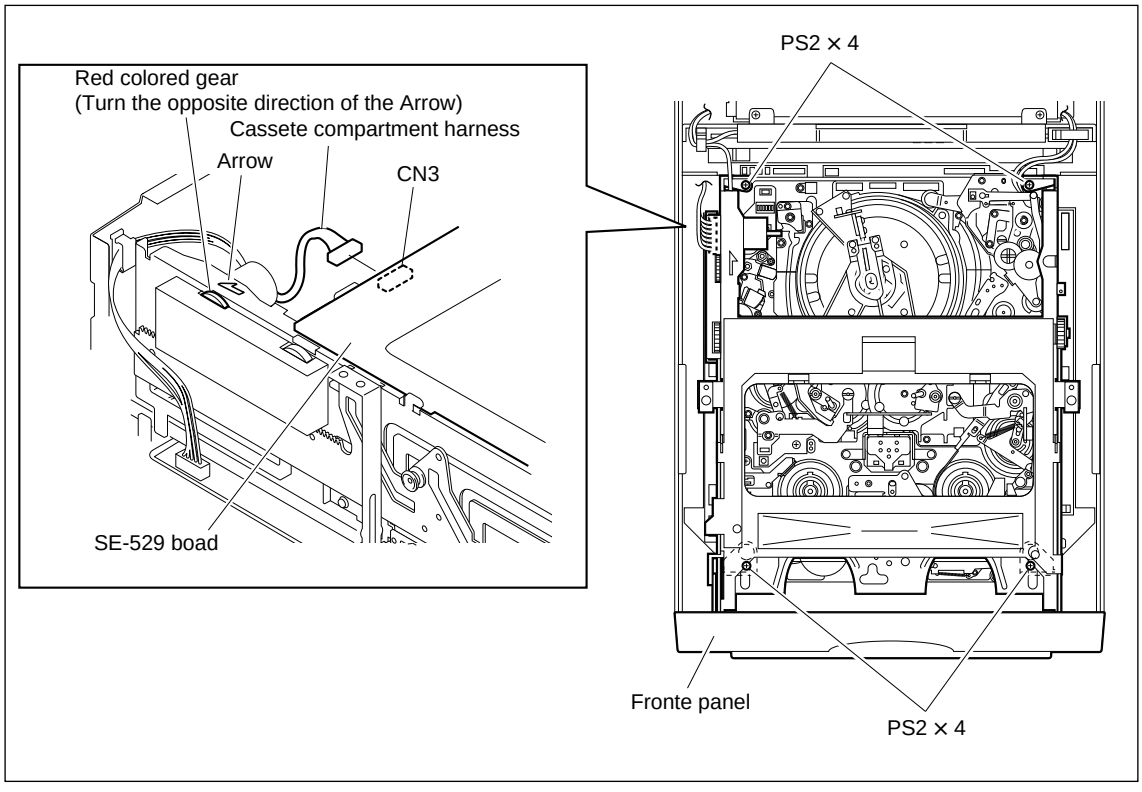


1-5. Removing/Reinstalling the Cassette Compartment

Note

When removing or reinstalling the cassette compartment, it is possible for screws to fall into the mechanical deck assembly. To prevent this, it is recommended to magnetize the screwdriver bit moderately.

1. Make sure the unit is in the unthreading end state.
2. Remove the top plate. (Refer to Section 1-4-1.)
3. Turn the red colored gear at the back right side of the cassette compartment to the opposite direction of arrow (EJECT) until the two securing screws at the front side of the cassette compartment comes into sight.

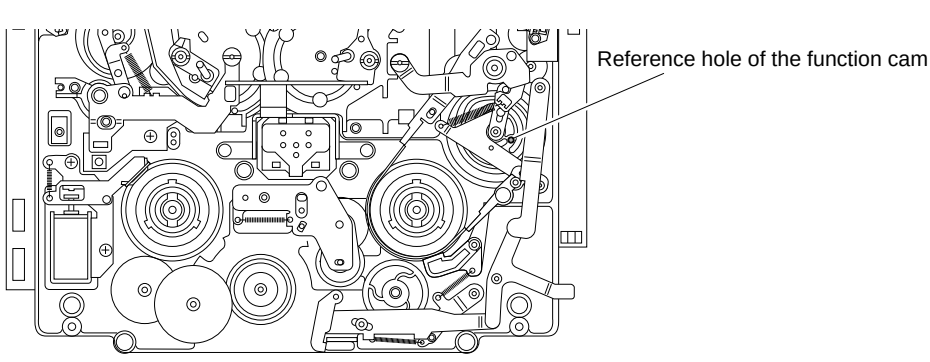


4. Disconnect the connector of the cassette compartment harness from the connector (CN3) on the SE-529 board.
5. Remove the four screws, and then remove the cassette compartment from the mechanical deck assembly while moving it back and forth gradually.

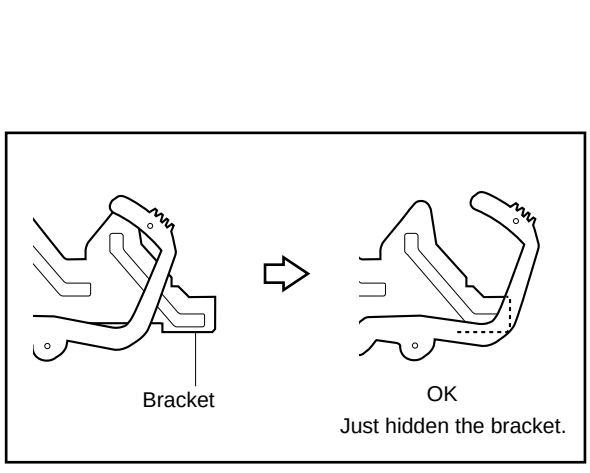
6. Reattach the cassette compartment in the reverse order of steps 1 to 5.

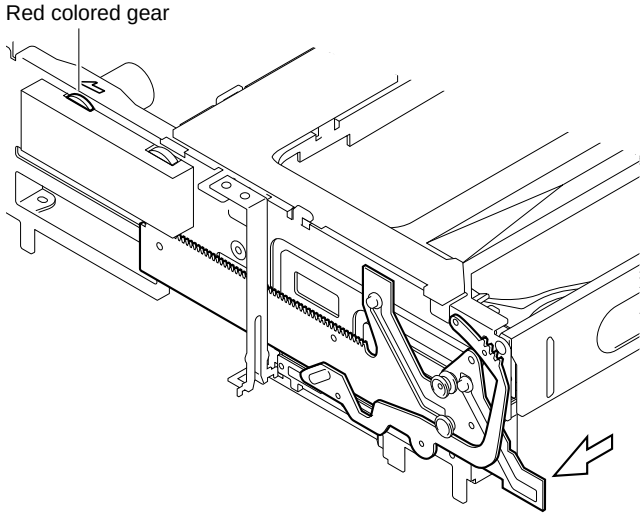
Notes

- Make sure that the slide panel is down.
- When reinstalling, make sure that the reference hole of the function cam on the mechanical deck assembly comes in sight in the position shown in the figure.
  If not, adjustment is required. The adjustment can be performed in two possible methods:
  (a) Turn on the power once. The reference hole will return to the proper position automatically.
  (b) Turn the manual eject knob (red) while pressing down until the reference hole of the function cam comes into sight.



- Make sure that the bracket of the cassette compartment shown in the figure is in the OK position. If not, turn the red colored gear of the cassette compartment.





- When reinstalling, take care that the harnesses connected with the brush of the drum are not caught.
- The screws securing the cassette compartment should be tightened as the following tightening torque.
  Tightening torque: 20×10^{-2} N•m {2.0 kgf•cm}

1-6. Disconnecting/Reconnecting the Printed Circuit Boards

This section explains the disconnecting and reconnecting procedures for plug-in boards and DM-114/ 114P board.

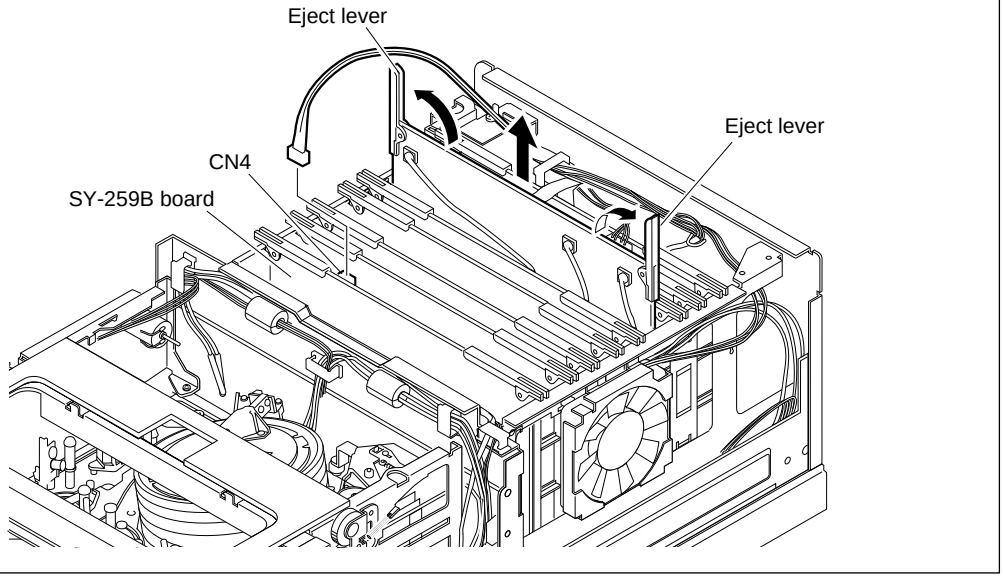
Note

Before disconnecting or reconnecting the printed circuit board, be sure to turn off the power. To power off, be sure to disconnect the battery or the cable connected to the DC IN connector, in addition to turning off the power switch.

1-6-1. Plug-in Boards

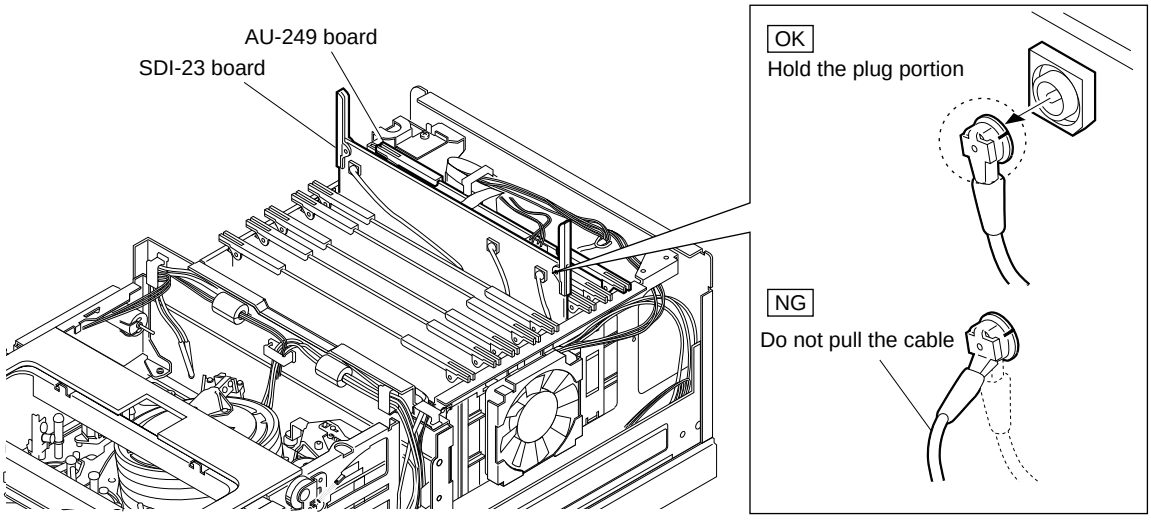
Disconnecting

1. Remove the top plate. (Refer to Section 1-4-1.)
2. Disconnect the harness connector from the connector CN4 on the SY-259B board.
3. Rise the eject levers as shown in the figure and pull the plug-in board out to upward.



Notes

- Before disconnecting the AU-249 board, disconnect the harness connector (CN1) extending from the connector panel.
- Before disconnecting the SY-259B board, disconnect the harness connector (CN4) extending from the connector panel.
- Before disconnecting the SDI-23 board, disconnect the three SDI cables (red, yellow and orange) connected to the SDI-23 board. When disconnecting the SDI cables, be sure to hold the plug portion. Do not pull the cable itself.



Disconnecting the SDI cable

Reconnecting

1. While tilting the board levers on both sides of the plug-in board, insert the plug-in board into the slots of the chassis. Finally pressed down the lever positions of the plug-in board as far as it will go so that the plug-in board is surely connected to the MB-757A board.

   Note

   When reinstalling the AU-249, SY-259B or SDI-23 board, reconnect the harness connector to the board.

2. Reattach the top panel. (Refer to Section 1-4-1.)

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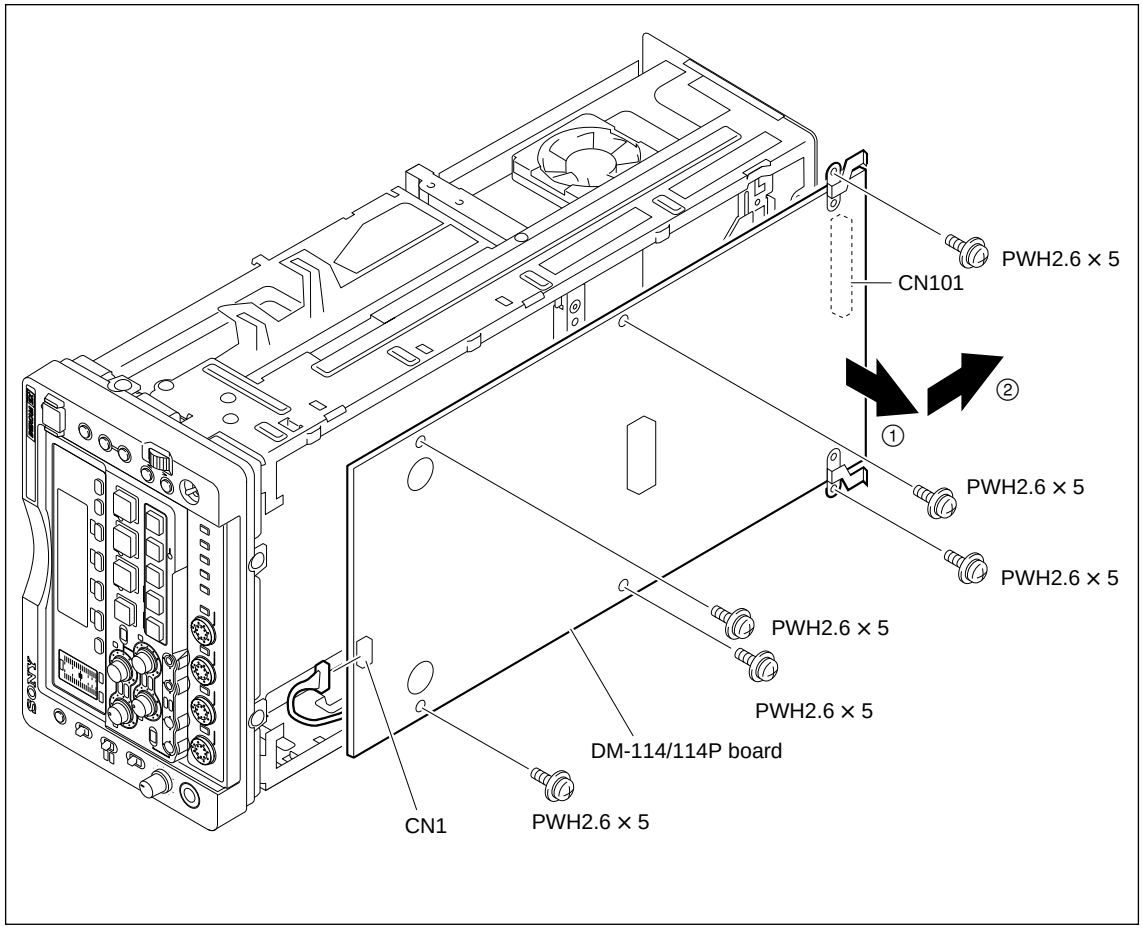
1-6-2. DM-114/114P Board

1. Remove the bottom plate. (Refer to Section 1-4-2.)
2. Remove the six screws securing the DM-114/114P board.
3. Move the DM-114/114P board at the connector panel side in the arrow ① direction to disconnect the connector CN101 connected with the MB-757A board, and then move it in the arrow ② direction to remove the board.
4. Disconnect the connector (CN1) on the DM-114/114P board.
5. Reattach the DM-114/114P board in the reverse order of steps 1 to 4.

Note

When reinstalling the board, be careful not to pinch the harness between the board and chassis.



1-7. Board Extension during Maintenance Service

1-7-1. Plug-in Board

Extend the plug-in board using the extension board EX-706 (option) when it is checked and adjusted.

Extension board	Part No.	Connected plug-in boards
EX-706	A-8321-000-A	APR-27A, AU-249, DEC-97, DPR-87, EQ-72, SDI-23, SY-259B
		SY-260, TG-191, VPR-34

Extension

Notes

- Be sure to turn off the power when removing and reinstalling the board. To power off, be sure to disconnect the cable connected to the DC IN connector or the battery, in addition to turning off the power switch.
- The EQ-72 board differs in an extension method. Refer to “1-7-2. EQ-72 Board” when extending the EQ-72 board.

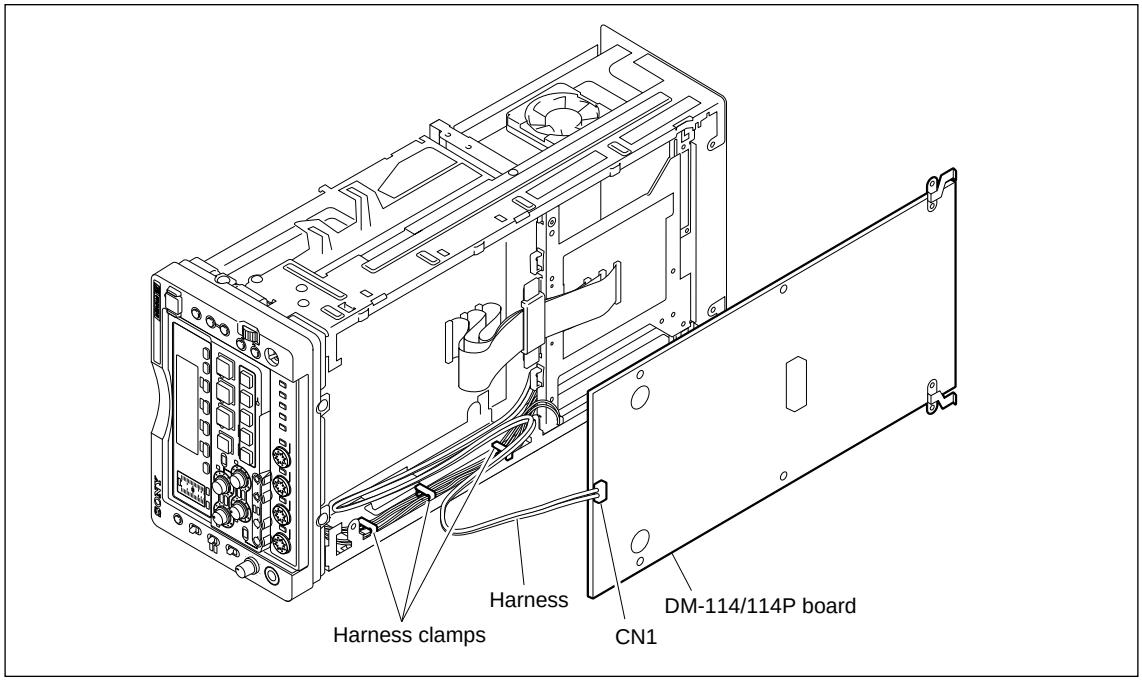
1. Remove the plug-in board to be checked or adjusted. (Refer to Section 1-6-1.)
   Note
   Before removing the plug-in board, remove the harnesses connected between SY-259B and AU-249 boards and connector panel from the cable clamp.
2. Connect the connectors on the extension board EX-706 to the connectors on the motherboard.
   Note
   Insert the extension board EX-706 with side A in the front.
3. Connect the connectors on the plug-in board to the connectors on the extension board EX-706.
   Note
   Be sure to check the three SDI cables are surely connected to the SDI-23 board when the SDI-23 board is extended.
4. Reinstall the plug-in board in the reverse order of steps 1 to 3.

1-7-2. EQ-72 Board

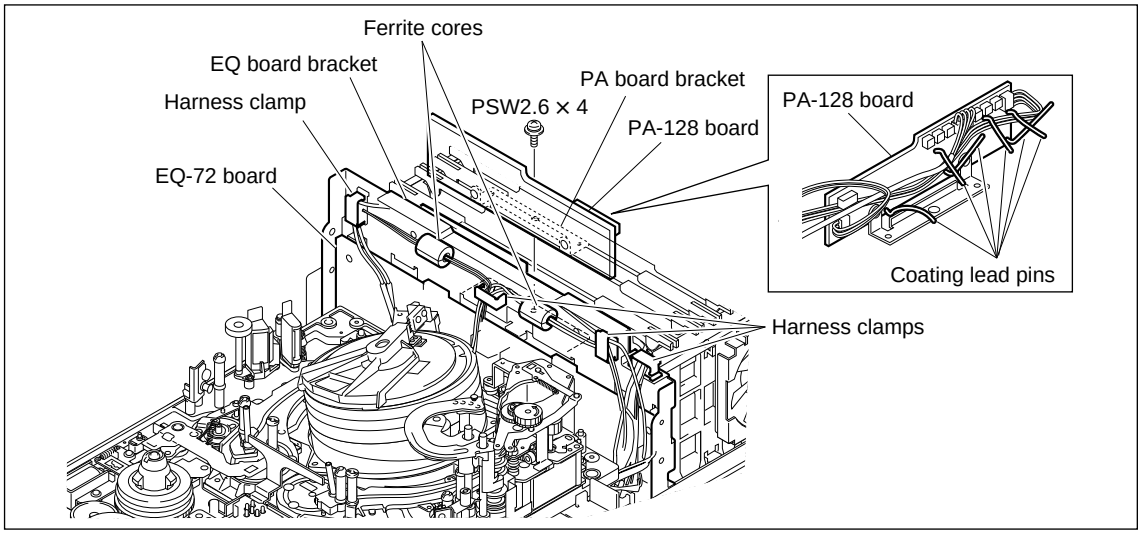
Note

Be sure to turn off the power when removing and installing the board. To power off, be sure to disconnect the cable connected to the DC IN connector or the battery, in addition to turning off the power switch.

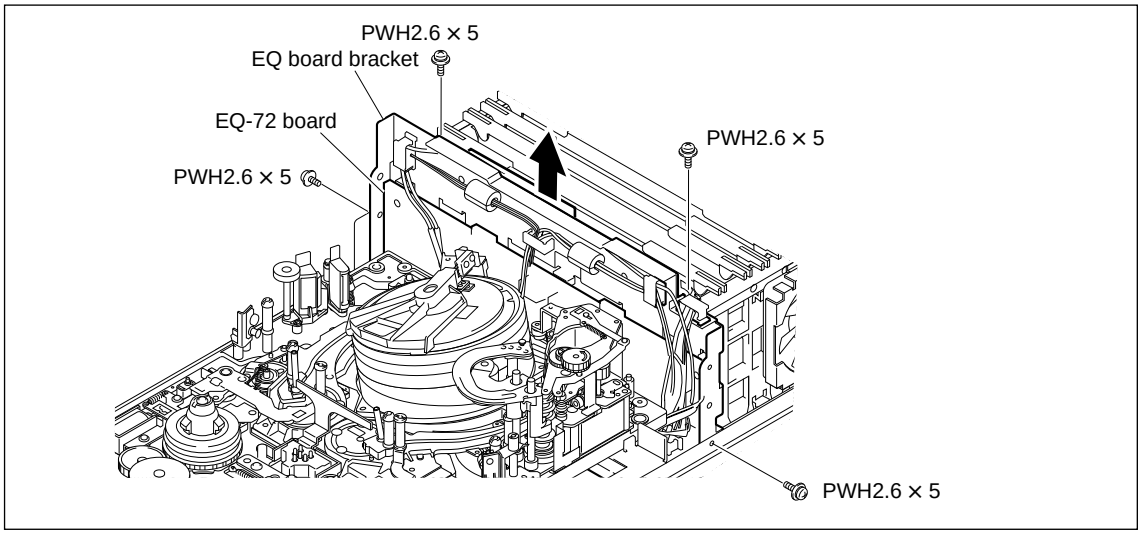
1. Remove the top plate. (Refer to Section 1-4-1.)
2. Remove the bottom plate. (Refer to Section 1-4-2.)
3. Remove the cassette compartment. (Refer to Section 1-5.)
4. Open the DM-114/114P board. (Refer to Section 1-6-2.)
5. Unfasten the three harness clamps, and free the harness connected between connector (CN1) of the DM-114/114P board and EQ-72 board.



6. Unfasten the four harness clamps shown in the figure, and free all harnesses clamped with these harness clamps.
7. Open the two ferrite cores, and free all harnesses.
8. Unfasten the four coating lead pins on the PA-218 board, and free all harnesses.
9. Remove a screw securing the PA board bracket from the EQ bracket.



10. Remove the four screws securing the EQ bracket, and pull the EQ bracket with board out to upward.



11. Connect the extension board EX-706 to the motherboard.
12. Connect the connectors on the EQ-72 board to the connectors on the extension board EX-706.
13. Reinstall the EQ-72 board in the reverse order of steps 1 to 12.

Notes

- When reinstalling the EQ-72 bracket, be careful not to pinch the harnesses between the bracket and chassis.
- Press down the EQ bracket to connect the EQ-72 board to the motherboard.
- Clamp the harnesses of the drum side with the four harness clamps.
- Close the two ferrite cores while taking care not to pinch the harnesses. After that, check that the ferrite cores move smoothly right and left.
- Hold the harnesses connected to the PA-128 board with the four coating lead pins soldered on the PA-128 board.

1-7-3. DM-114/114P Board

Extension

Note

Be sure to turn off the power when removing and installing the board. To power off, be sure to disconnect the cable connected to the DC IN connector or the battery, in addition to turning off the power switch.

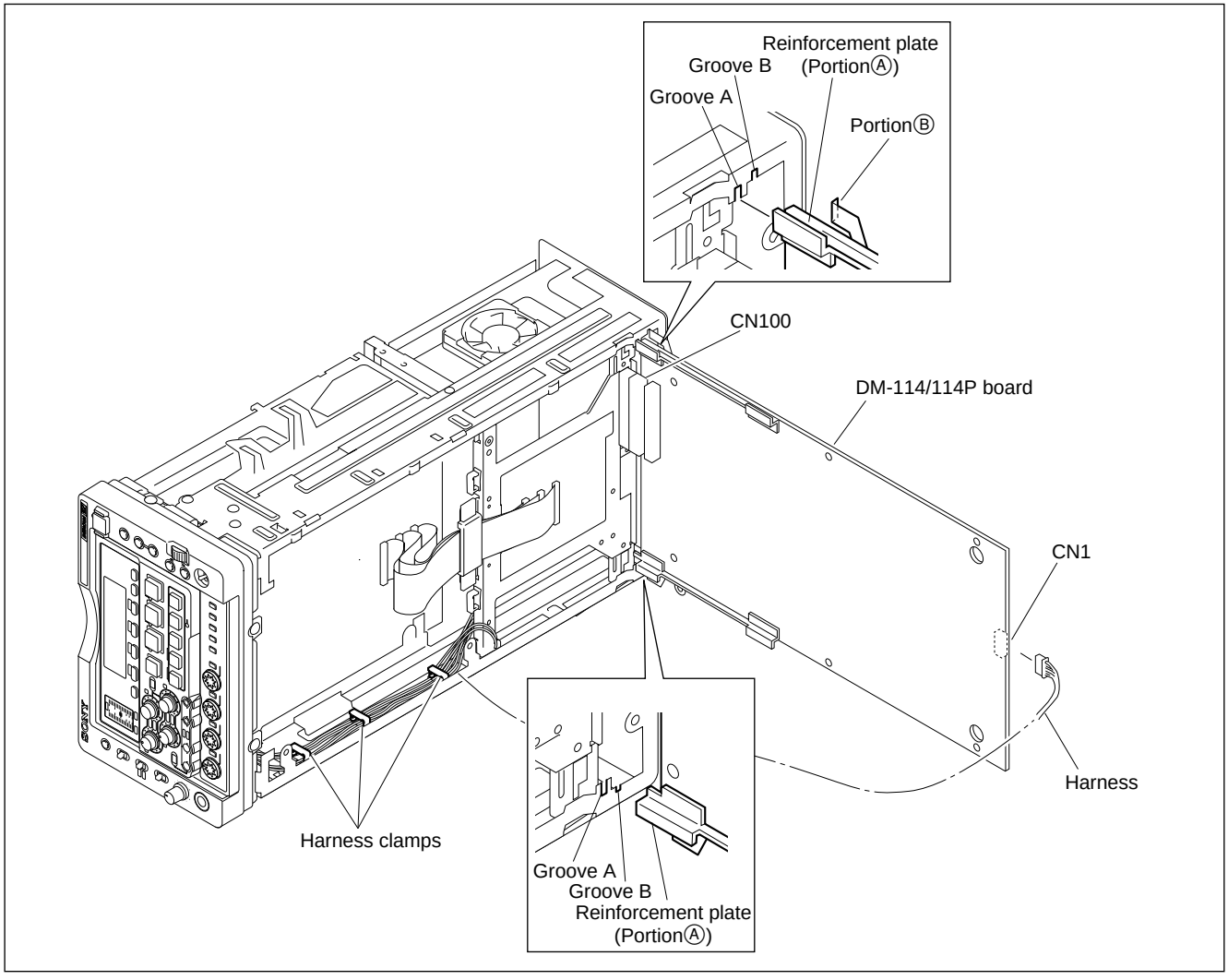
1. Remove the DM-114/114P board. (Refer to Section 1-6-2.)
2. Unfasten the three harness clamps, and free the harness connected with the connector (CN1) on the DM-114/114P board.
3. Connect the connector (CN100) while inserting portions Ⓐ and Ⓑ of reinforcement plates on the DM-114/114P board into the grooves A and B of the unit.

   Note

   Ensure that the bended portions Ⓑ (both top and bottom) are surely holded by grooves B.
4. Reinstall the board in the reverse order of steps 1 to 3.

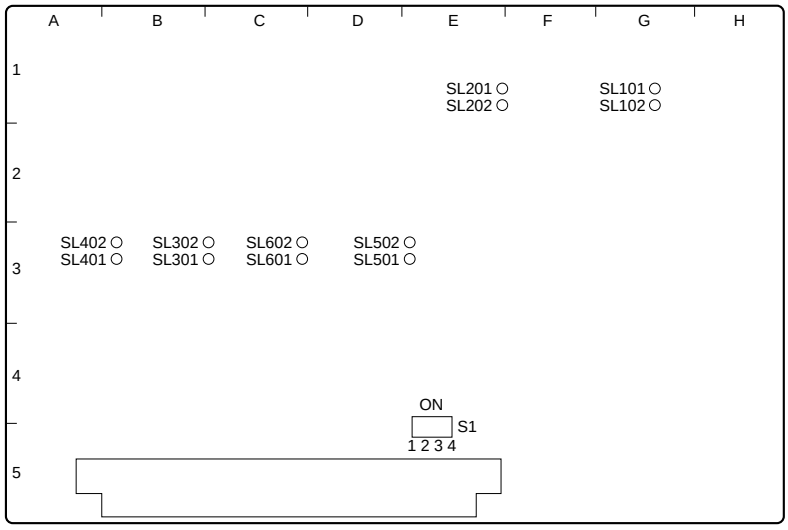
   Note

   When reinstalling the DM-114/114P board, be careful not to pinch the harness between the board and chassis.



1-8. Settings for Internal Switches/Slit Lands

AU-249 Board



AU-249 Board (A Side)

Settings for Audio Input Headroom CH1, CH2 (for slit lands)

Channel	Ref.No.(Indication)	Input headroom (20 dB)	( ) : Factory setting 18 dB	16 dB
CH1	SL101 (18 dB)	Open	Short	Open
	SL102 (16 dB)	Open	Open	Short
CH2	SL201 (18 dB)	Open	Short	Open
	SL202 (16 dB)	Open	Open	Short

Settings for Audio Output Headroom CH1/CH3, CH2/CH4 (for slit lands)

Note

Selections of CH1/CH3 and CH2/CH4 are made using the sub menu.

Channel	Ref.No.(Indication)	Output headroom (20 dB)	( ) : Factory setting 18 dB	16 dB
CH1/CH3	SL301 (18 dB)	Open	Short	Open
	SL302 (16 dB)	Open	Open	Short
CH2/CH4	SL401 (18 dB)	Open	Short	Open
	SL402 (16 dB)	Open	Open	Short

Settings for Monitor Output Headroom (for slit lands)

Channel	Ref.No.(Indication)	Output headroom ( ) : Factory setting (20 dB)	18 dB	16 dB
L	SL501 (18 dB)	Open	Short	Open
	SL502 (16 dB)	Open	Open	Short
R	SL601 (18 dB)	Open	Short	Open
	SL602 (16 dB)	Open	Open	Short

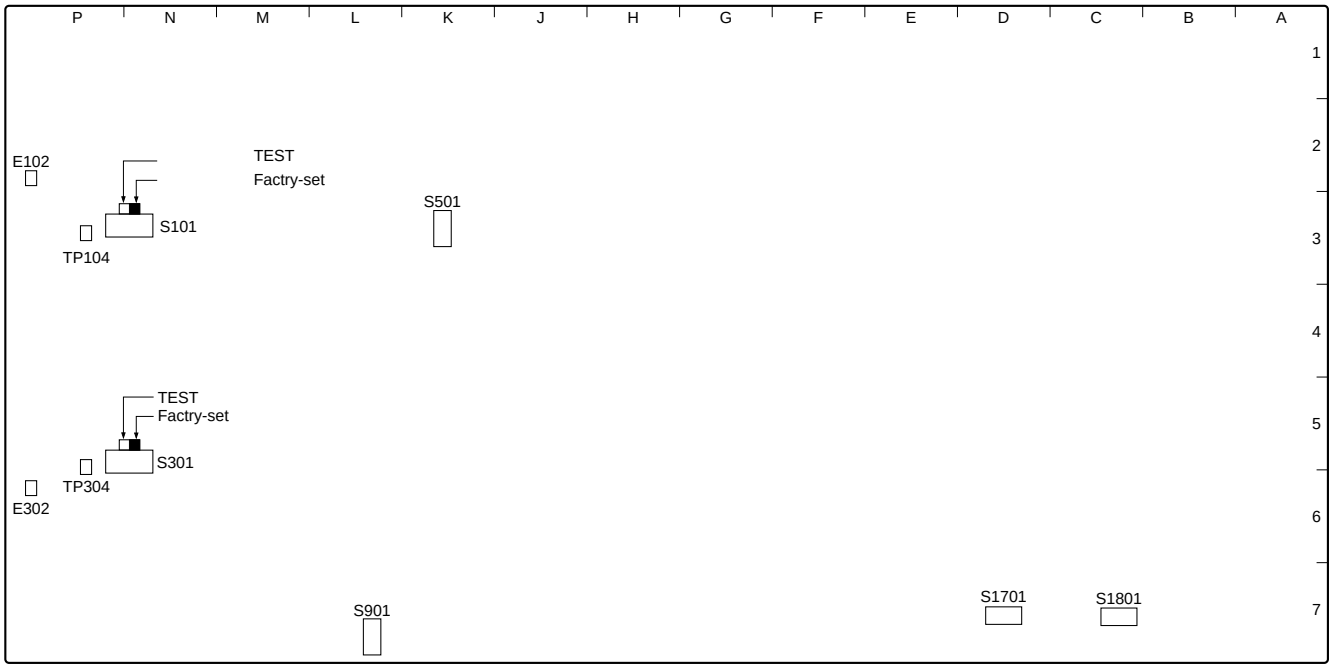
Switches

Note

Do not change settings of the factory-use switches.

Ref.No.	Description	Factory setting
S1-1	Factory use	OFF
S1-2	Factory use	OFF
S1-3	Factory use	OFF
S1-4	Factory use	OFF

DM-114/114P Board



DM-114/114P Board (B Side)

Switches

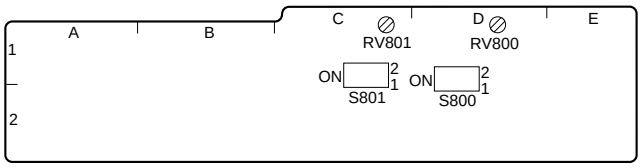
Note

Do not change settings of the factory-use switches.

Ref.No.	Switch name	Description	Factory setting
S101	Y EQ TEST	Test signal connection switch for Y RF LPF&EQ adjustment In adjusting, input the test signal to TP104 (GND to E102) with S101 set to TEST (see illustration) position	See illustration
S301	C EQ TEST	Test signal connection switch for C RF LPF&EQ adjustment In adjusting, input the test signal to TP304 (GND to E302) with S301 set to TEST (see illustration) position	See illustration
S501		Factory use	OFF
S901-1	RF ADJ	Use for RF EQ adjustment. OFF: Normal mode ON: Adjustment/Test mode	OFF
S901-2		Factory use	OFF
S901-3	AGC OFF	Turns on and off the AGC function during RF EQ adjustment OFF: Normal mode (AGC is turned on) ON: AGC is turned off	OFF
S901-4		Factory use	OFF

Ref.No.	Switch name	Description	Factory setting
S1701-1	Y MUTE	OFF: Normal mode ON: Luminance signal is muted	OFF
S1701-2		Factory use	OFF
S1701-3		Factory use	OFF
S1701-4	C MUTE	OFF: Normal mode ON: Color difference signal is muted	OFF
S1701-5	COMB	Selects whether a comb filter is turned on or off when the color difference signal has the significant line crawl which the LCC cannot correct OFF: Normal mode (Comb filter is turned off) ON: Comb filter is turned on	OFF
S1701-6		Factory use	OFF
S1701-7		Factory use	OFF
S1701-8		Factory use	OFF
S1801-1	D CLP OFF	Turns on and off the digital clamp function Usually turn off this switch, and a DC difference between B-Y and R-Y signals (if present) is corrected by the digital clamp function Turn on only to turn off the digital clamp for test OFF: Normal mode (Digital clamp is turned on) ON: Digital clamp is turned off	OFF (Digital clamp ON)
S1801-2		Factory use	OFF
S1803-3		Factory use	OFF
S1803-4		Factory use	OFF

PA-218 Board



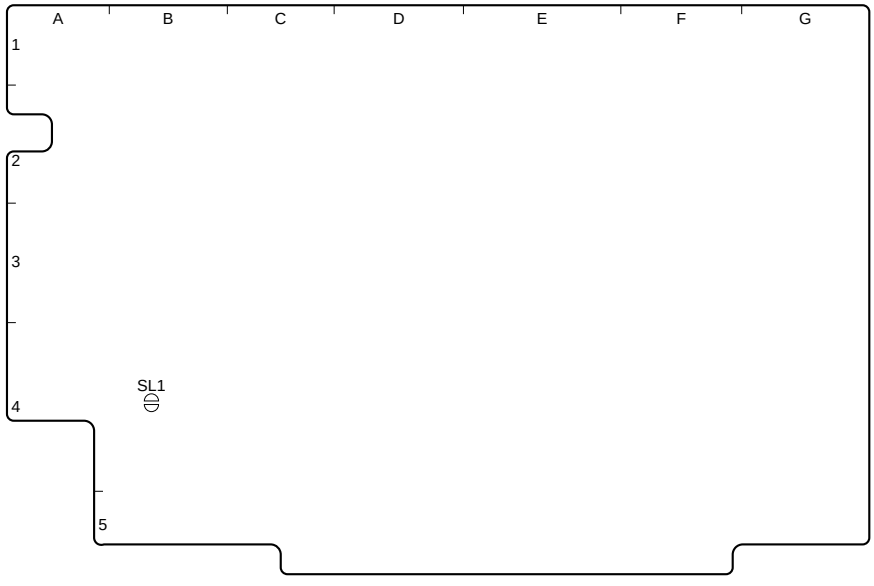
PA-218 Board (A Side)

HEAD TUNE switches (for Betacam/Betacam SP longitudinal audio playback)

At installation, it is unnecessary to change setting of these switches.

Channel	Ref.No	Description
CH1	S800	Adjusts the CH1 head amp high frequency response together with RV800 This switch adjusts the resonance frequency and RV800 adjusts the audio head dumping Switch position differs depending on the adjustment condition at the factory
CH2	S801	Adjusts the CH2 head amp high frequency response together with RV801 This switch adjusts the resonance frequency and RV801 adjusts the audio head dumping Switch position differs depending on the adjustment condition at the factory

RE-150 Board



RE-150 Board (A Side)

Slit Land

Ref.No.	Description	Factory setting
SL1	Selects how the power is derived when the battery and external power supply are used simultaneously Open: Always derived from the external power supply Short: Normally derived from the external power supply When an input voltage is 10.5 V or below, automatically selects the battery	Open

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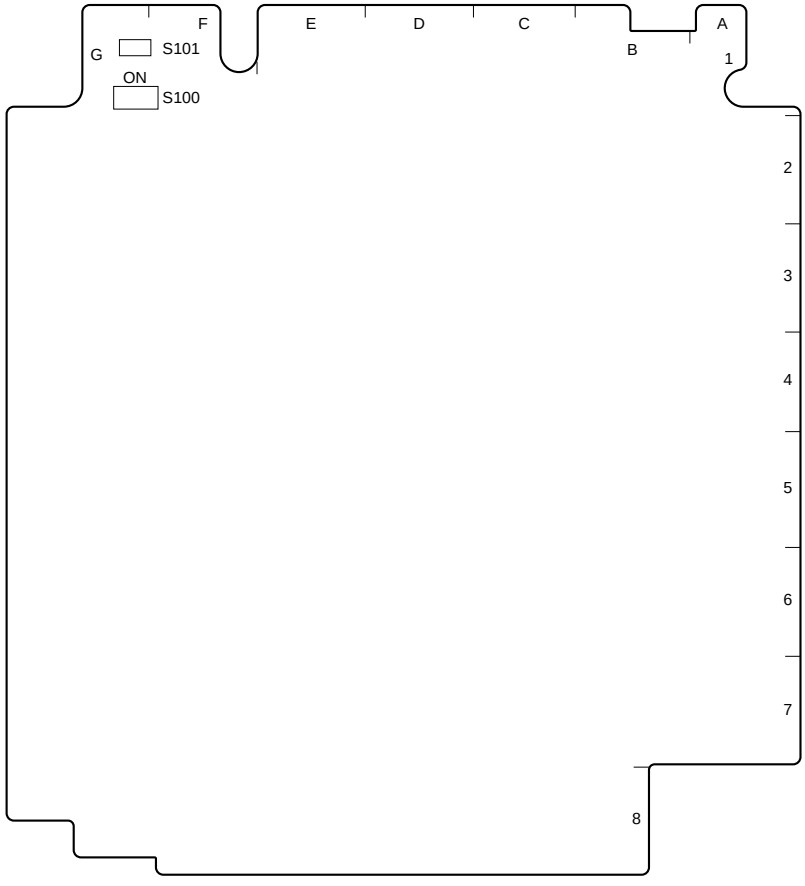
SV-194A Board



SV-194A Board (B Side)

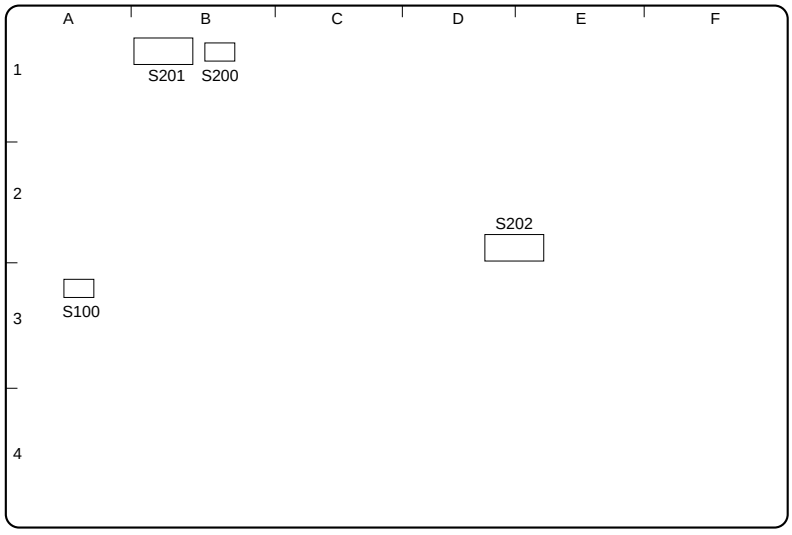
Switches

Note

Do not change settings of the factory-use switches.

Ref.No.	Switch name	Description	Factory setting
S100-1	CASSETTE COMPARTMENT LOCK	Turns on and off the function to assume that the cassette compartment is locked without the cassette compartment installed ON: Assumes the cassette compartment is locked OFF: Normal mode	OFF
S100-2	SERVO ERR NOT DET	Turns on and off the function to detect the servo error ON: Servo error is not detected OFF: Normal mode	OFF
S100-3		Factory use	OFF
S100-4	AUTO TRACKING OFF	Turns on and off the function to inhibit the auto-tracking during the tape path adjustment ON: Inhibits the auto-tracking (Tracking VR becomes active) OFF: Normal mode	OFF
S100-5		Factory use	OFF
S100-6		Factory use	OFF
S101	INITIAL	When powered on while pressing this switch, the servo adjustment data is returned to its default value	——

SY-259B Board



SY-259B Board (A Side)

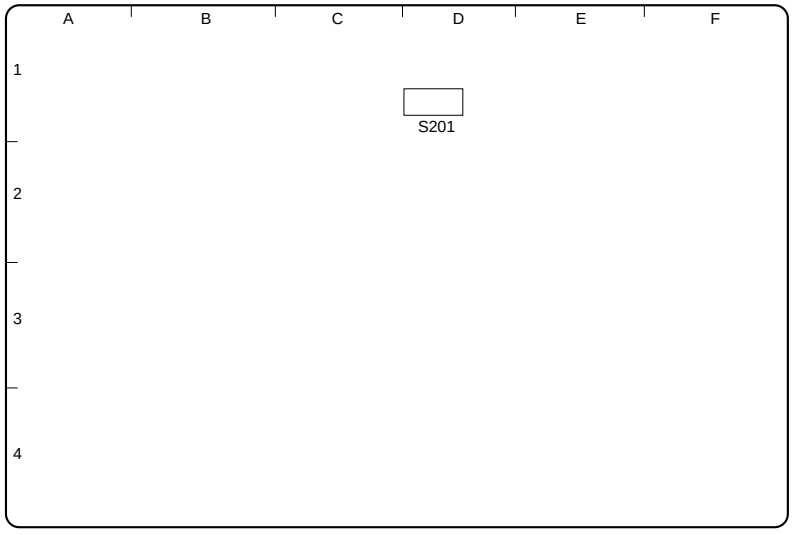
Switches

Note

The switches S202-5 to S202-8 have been set at the factory according to the characteristics of a VTR or unit. Only when replacing the board, be sure to change settings following instructions.
Also do not change settings of the factory-use switches.

Ref.No.	Switch name	Description	Factory setting
S100	SYSTEM RESET	Press to reset system control operation	——
S200	MAINTE MODE START	Press to start the maintenance mode	——
S201-1	EXTENDED MENU	Turns on and off the indication of extended setup menu OFF: Not indicated ON: Indicated	OFF
S201-2	MAINTE MODE ACEESS	OFF: Not accessible to the maintenance mode from the front panel ON: Accessible to the maintenance mode from the front panel	OFF
S201-3 to S201-8		Factory use	OFF
S202-1		Factory use	OFF
S202-2		Factry use	OFF
S202-3		Factory use	OFF
S202-4		Factory use	ON
S202-5		Factory use	OFF
S202-6		Factory use	OFF
S202-7	J/UC	OFF: for Japan ON: except Japan	ON
S202-8	525/625	OFF: 525/60 model ON: 625/50 model	OFF (for DNW-A28) ON (for DNW-A28P)

SY-260 Board



SY-260 Board (A Side)

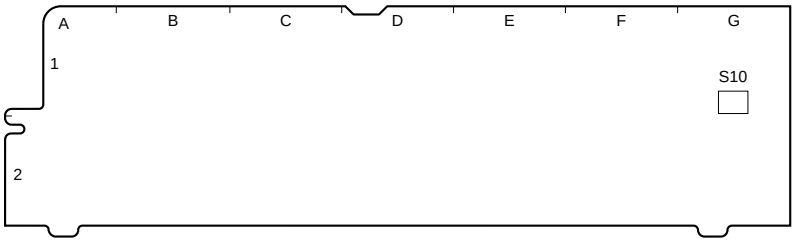
Switches

Note

Do not change settings of the factory-use switches.

Ref. No.	Switch name	Description	Factory setting
S201-1	PINCH ON/OFF	Selects the pinch solenoid ON/OFF operation ON: Normal mode OFF: Inhibits the pinch solenoid operation	ON
S201-2~ S201-8		Factory use	OFF

SW-21 Board



SW-21 Board (A Side)

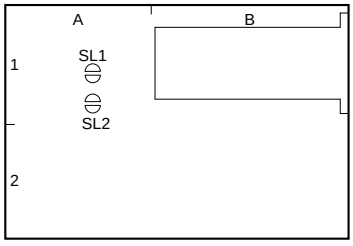
Switches

Note

Do not change settings of the factory-use switches.

Ref. No.	Switch name	Description	Factory setting
S10-1	BATT ID	Factory use	OFF
S10-2		Factory use	OFF

HP-100 Board



HP-100 Board (A Side)

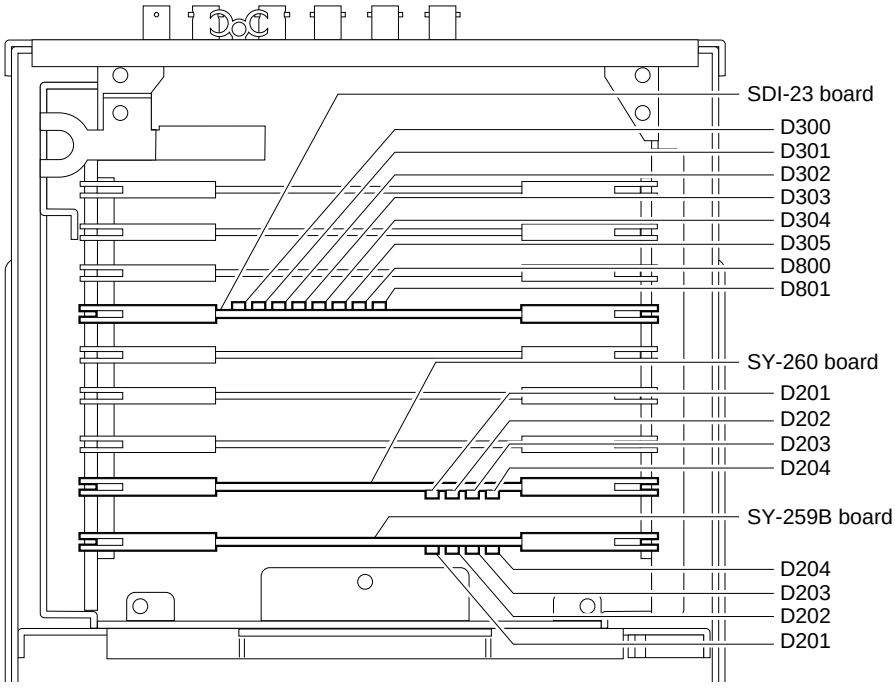
Slit Lands

Note

Do not change settings of the factory-use slit lands.

Ref. No.	Description	Factory setting
SL1	Factory use	Open
SL2	Factory use	Open

1-9. Description on Internal Indicators



SDI-23 Board

Note

The indicators D302 to D305 function properly when the received signal conforms to the EDH* (with D301 lit).

* EDH : Error Detection and Handling

Ref.No.	Indictor name	Color	Description	Normal state
D300	SDI INPUT EXIT	Green	Lit when detecting the SDI format signal input at SDI IN connector	ON
D301	RX EDH VALIDITY	Green	Lit when the received signal at SDI IN connector conforms to the EDH	ON
D302	RX EDH OTHER ANC ERROR	Red	Lit when another ancillary data exists in the EDH portion of the received signal at SDI IN connector	OFF
D303	RX EDH ACTIVE PICTURE ERROR	Red	Lit when an active picture EDH error is detected from the received signal at SDI IN connector	OFF
D304	RX EDH FULL FIELD ERROR	Red	Lit when a full-field EDH error is detected from the received signal at SDI IN connector	OFF
D305	RX EDH ANCILLARY DATA ERROR	Red	Lit when an ancillary data EDH error is detected from the received signal at SDI IN connector	OFF
D800	SDI TRS NO ERROR	Green	Lit when the SDI format signal is normally received at SDI IN connector	ON
D801	VCO ADJ OF MAINTENANCE	Green	Lit when EVR (electronic volume) data comes near its proper value during VCO free-run adjustment in the maintenance mode	——

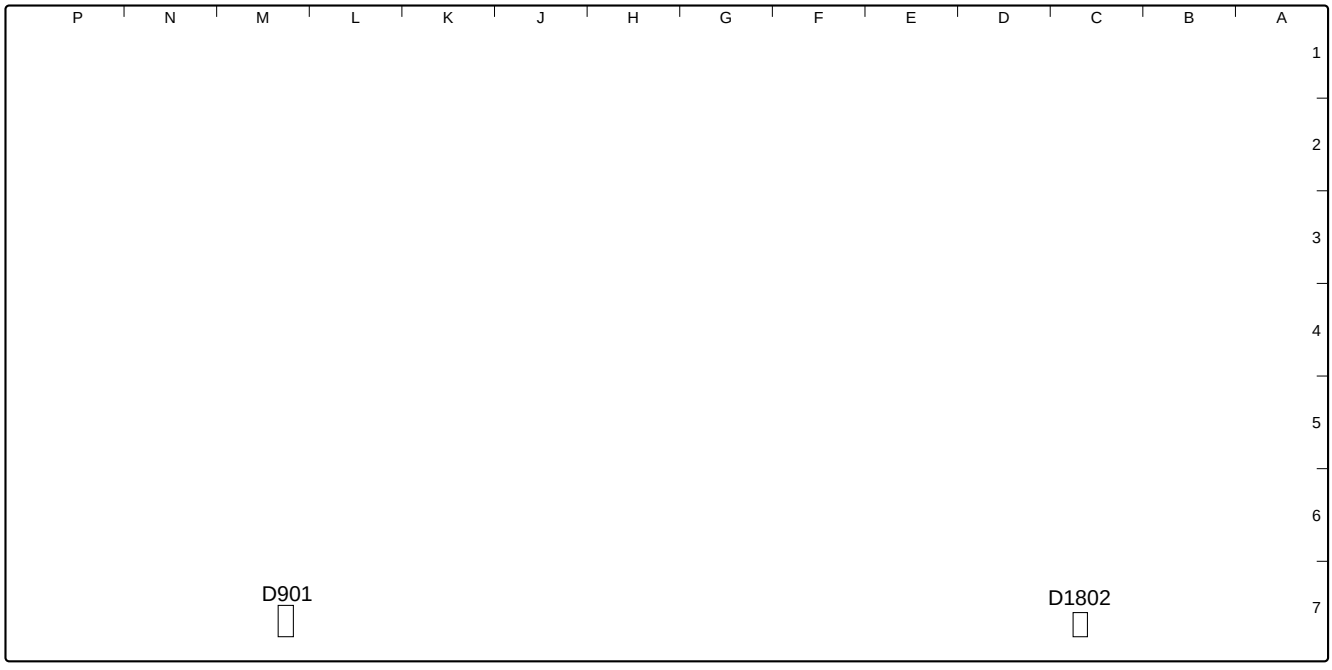
SY-259B Board

Ref.No.	Indicator name	Color	Description	Normal state
D201	SY1 STS1	Green	Blinks when the SYS1 CPU normally operates	Blinking
D202	SY1 STS2	Green	Lit when communication between SYS1 CPU and front panel is under normal conditions Unlit when the above communication is under abnormal conditions	ON
D203	MAINTE	Green	Lit during execution of the maintenance mode	OFF
D204	SY1 ERR	Red	Lit when the SYS1 CPU does not normally operate Blinks when communication between SYS1 CPU and other CPU (SYS2, or KY) is under abnormal conditions	OFF

SY-260 Board

Ref.No.	Indicator name	Color	Description	Normal state
D201	SY2 STS1	Green	Blinks when the SYS2 CPU normally operates	Blinking
D202	SY2 STS2	Green	Lit when communication between SYS2 CPU and SV CPU is under normal conditions Unlit when the above communication is under abnormal conditions	ON
D203	SY2 STS3	Green	Lit when communication between SYS2 CPU and SYS1 CPU is under normal conditions Unlit when the above communication is under abnormal conditions	ON
D204	SY2 ERR	Red	Lit when the SYS2 CPU does not normally operate. Blinks when communication between SYS2 CPU and other CPU (SYS1, or SV) is under abnormal conditions	OFF

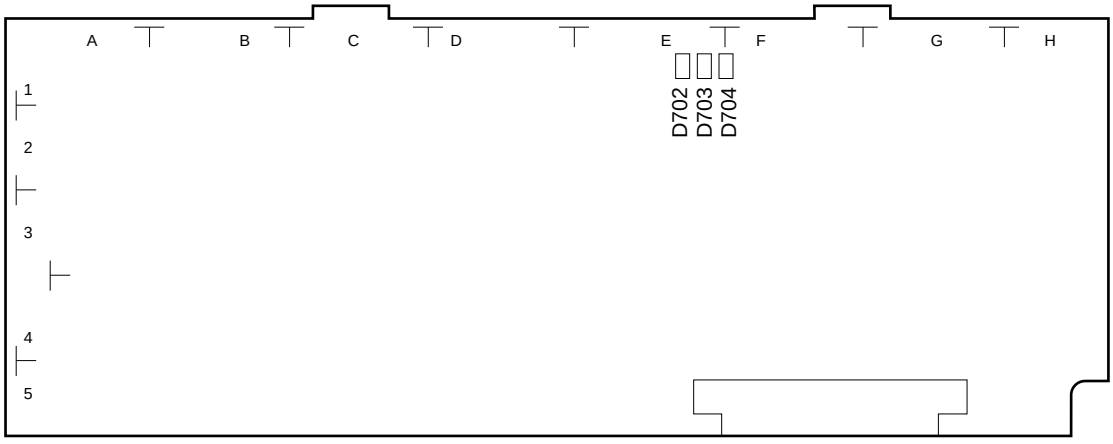
DM-114/114P Board



DM-114/114P Board (B Side)

Ref.No.	Indicator name	Color	Description	Normal state
D901	ADJUST	Green	Normally blinks for some ten milliseconds at intervals of about 1 sec. In adjustment mode (with S901-1 turned on), the blink is inverted	Blinking
D1802	TBC	Green	Blinks once a second during TBC micro-computer operation	Blinking

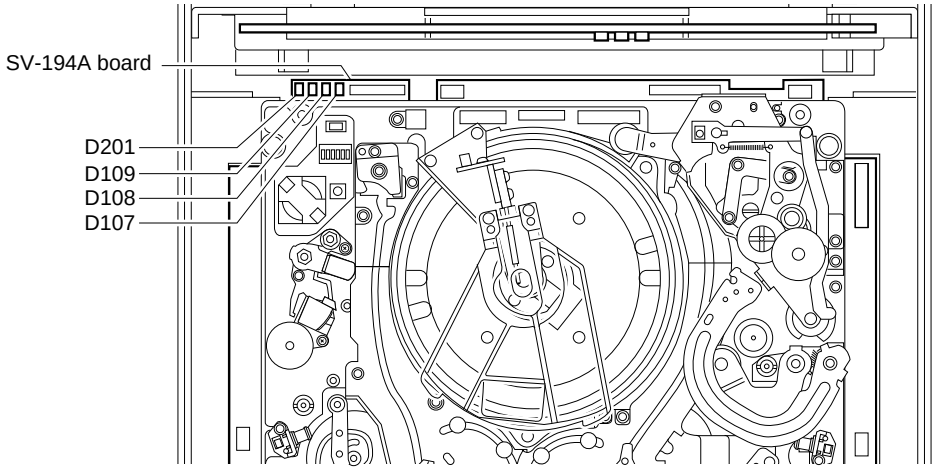
EQ-72 Board



EQ-72 Board (A Side)

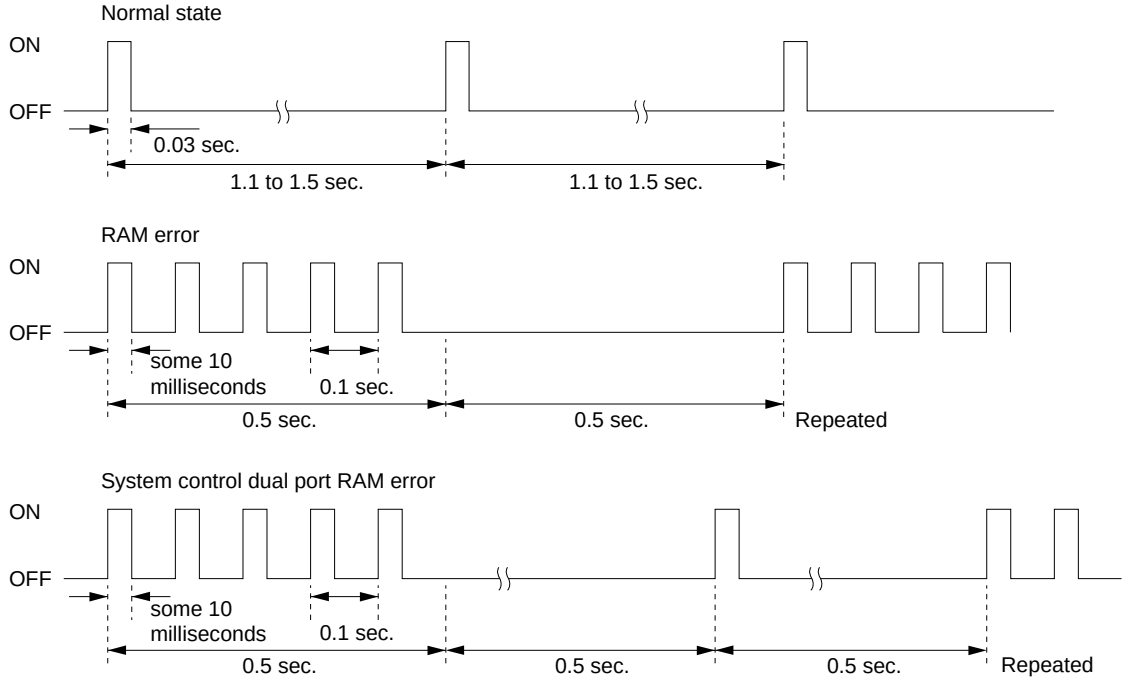
Ref.No.	Color	Description	Normal state
D702	Green	Lit only in the analog playback mode	——
D703	Red	Lit only in the REC mode	——
D704	Red	Blinks when EQ microcomputer normally operates Lit when any of the following errors occurs 1. NV-RAM check sum error 2. NV-RAM verifying error 3. INNER ECC status error 4. REC data parity error 5. When conditions necessary for automatic adjustment are not ready 6. When communication with system control is not started	Blinking

SV-194A Board



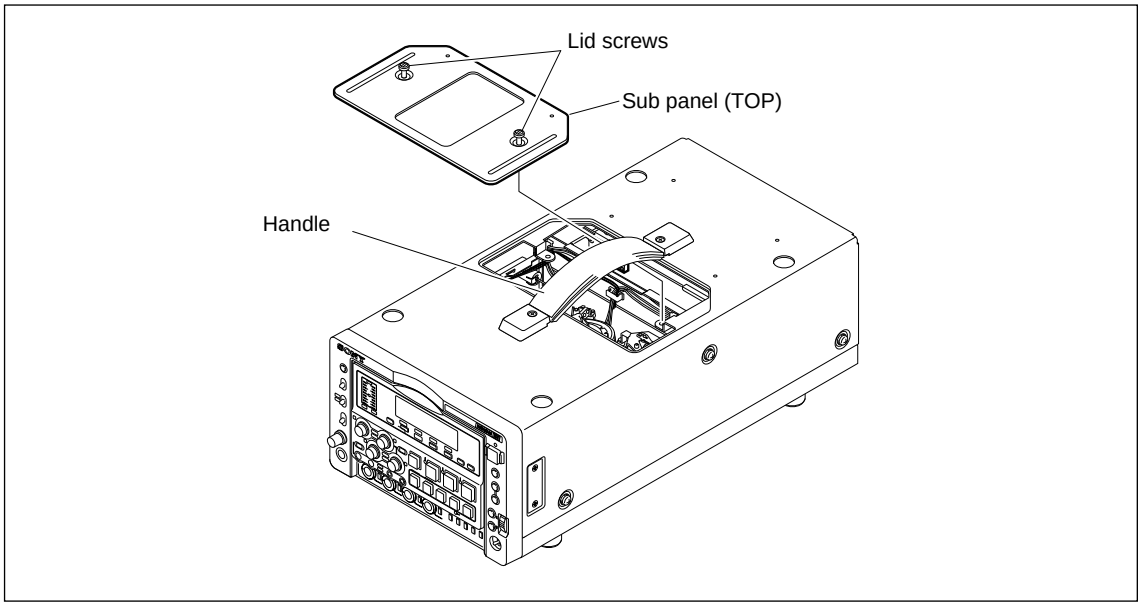
Ref.No.	Indicator name	Color	Description	Normal state
D107	SV	Green	Indicates by changing blinking intervals the result of communication check to ROM and RAM at power on (See illustration below)	Blinking
D108			Not used	——
D109	TRVR	Yellow	Lit when tracking VR operation is active (with S100-4 turned on)	OFF
D201	DRUM	Green	Blinks during drum microcomputer (IC212) operation Normally blinks for 30 milliseconds at intervals of about 1 sec. When the drum is locked, the blink is inverted	Blinking

Blinking pattern of D107

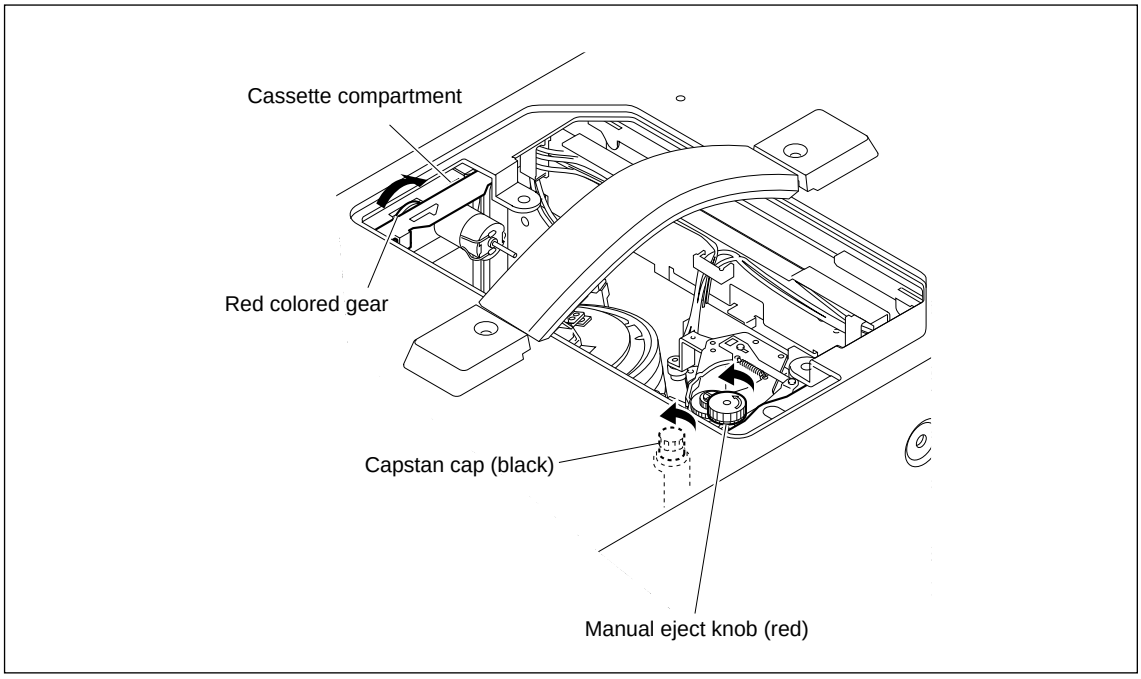


1-10. How to Take Out the Cassette Whose Tape is Slacked

1. Pull up the handle so it bows upwards, and then loosen the two lid screws using a coin and so on to remove the sub panel (TOP).



2. Turn the manual eject knob (red) as shown in the figure counterclockwise while pressing down.
3. When the tape starting to slack, turn the capstan cap portion counterclockwise to take up the tape to the T reel.
4. Repeat steps 2 and 3 until the unthreading operation is completed.
5. When the unthreading operation is completed, turn the red colored gear of the cassette compartment in the direction of the arrow (EJECT) until the cassette compartment is up state as shown in the figure.



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1-11. Cleaning Clogged Video Heads

When the video heads are clogged, be sure to clean using a cleaning tape.
If the use of the cleaning tape does not solve clogged, clean using a cleaning cloth.
When using the cleaning tape, use the specified tape (or cloth) and follow only the instructions with an extreme care.
If not, the video heads may be damaged or worn out.
For details on how to clean, refer to Section 4 “Periodic Maintenance and Inspection”.

Reference

To clean using a cleaning tape:
4-2-1. Using Cleaning Tape

To clean using a cleaning cloth:
4-2-2. General Information for the Use of Cleaning Cloth
4-2-3. Cleaning of Video Heads and Tape Running Surface of Upper Drum

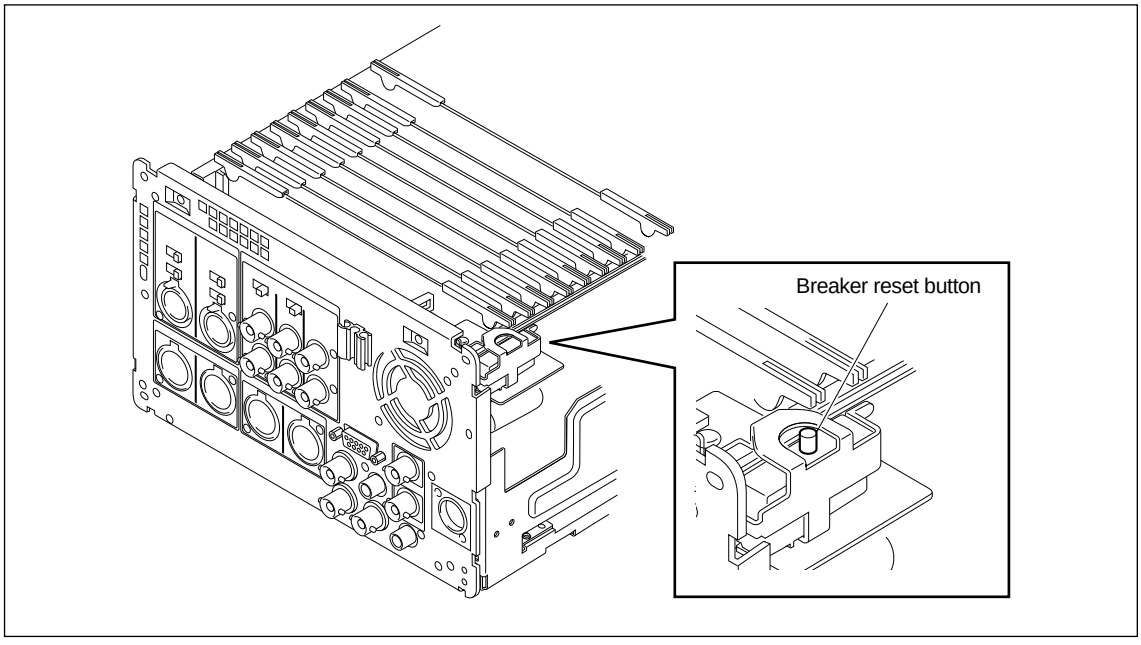
Specified Cleaning Tape

BCT-5CLN

1-12. Power Protection

1-12-1. Reset of Breaker

Overcurrent in the internal circuitry will trip the circuit breaker. If the breaker trips once, turn off the power and remove the top plate, and then check the circuit for overcurrent. To power off, be sure to disconnect the cable connected to the DC IN connector or the battery, in addition to turning off the power switch.
Press the breaker reset button shown in the figure and the power to the unit will be turned on.



1-12-2. IC Link

The IC link F1 is mounted on the CP-354 board. PS600 on the CP-354 board will blow by overcurrent when an equipment connected to the DC OUT connector fails.
If the IC link blows, turn off the power once, and then check the inside of the unit or the peripheral unit being connected to the DC OUT connector to find the cause and recover the unit.
When replacing, be sure to use the specified part.

WARNING

The IC link is critical for safe operation. Be sure to replace it with the specified part to avoid the danger of a fire or electric shock.

Board	Ref.No.	Description	Part No.
CP-354	PS600	IC LINK 2 A	⚠1-533-282-21

1-13. Battery for Memory Backup

The unit is equipped with a battery for the memory (IC112) backup on the SY-259B board. When replacing, be sure to use the specified part.

Replacement Part:	BT112/SY-259B board
Part Description:	M4T28-BR12SH1 (lithium-ion battery)
Part No.:	⚠1-767-156-11
Recommended Replacement Period:	Every seven years

In the memory, the following data are stored. When the battery is dead, or replaced with a new one, resetting current menu and menu banks 1 to 4 are required. For details on how to reset, refer to the operation manual supplied with the unit.
When the battery is dead, or replaced, error logs are all cleared.

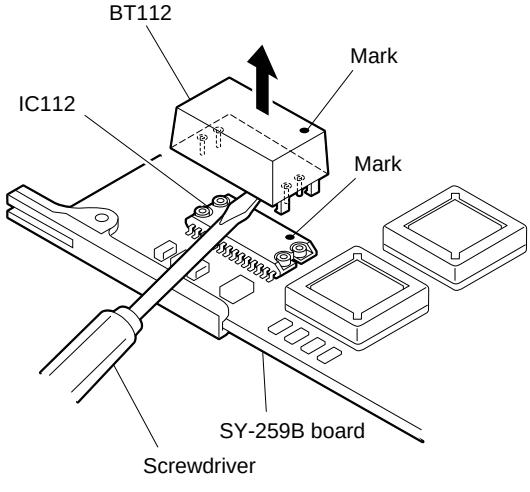
- Current menu
- Menu banks 1 to 4

Replacement

WARNING

When replacing the battery, ensure that a mark on the battery is correctly oriented as shown in the following figure. Improper connection may cause an explosion or leakage of fluid.

1. Pull the SY-259B board out. (Refer to Section 1-6-1.)
2. Insert a flat blade screwdriver between BT112 and IC112 to remove the battery.
3. Carefully install a new battery, ensuring that the mark's on the BT112 and IC112 are aligned.
4. Reset the current menu and menu banks. (Refer to the operation manual.)



1-14. Disconnecting/Reconnecting Flexible Card Wire

Three flexible card wires are used to connect between the MB-757A and SV-194A boards.

Notes

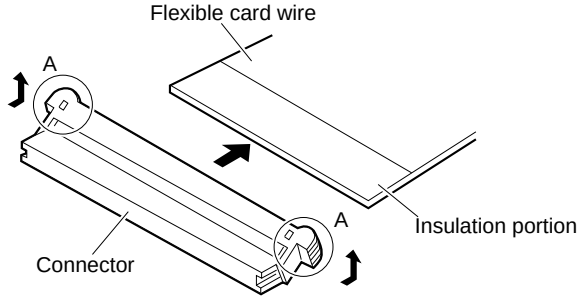
- Be sure to turn off the power when disconnecting and connecting the flexible card wire. To power off, be sure to disconnect the cable connected to the DC IN connector or the battery, in addition to turning off the power switch.
- The holded flexible card wire remarkably shortens the life span. Pay careful attention when handling it.

Disconnecting

Notes

- Do not pull the flexible card wire before unlocking.
- There are a conductive portion (printed side) and insulation portion (white belt) in the flexible card wire. Confirm the direction of the flexible card wire before connecting it.

1. Unlock by shifting portion A of the connector in the direction indicated by the arrow, then pull out the flexible card wire.

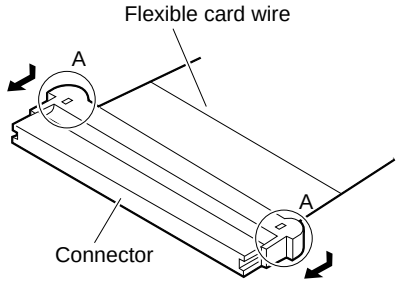


Reconnecting

Notes

- Ensure that no stain or dust adheres on the conductive surface of the flexible card wire.
- Ensure that the connector is unlocked.

1. Insert the flexible card wire firmly as far as it will go.
2. Press in the portion A of the connector in the direction indicated by the arrow to lock the connector. At that time, take care that the flexible card wire is not inclined.



1-15. NV-RAM/EEPROM

Describes ICs that require the initialization and adjustment of data after replacing itself.

Board name	Ref. No.	Address	IC type	Description
EQ-72	IC703	G2 (Side A)	NV-RAM	EQ board adjustment data
DEC-97	IC34	C3 (Side A)	EEPROM	DEC board adjustment data
DM-114/114P	IC909	M7 (Side A)	NV-RAM	DM board adjustment data
	IC1812	C6 (Side A)	NV-RAM	
VFD Assembly	U23	—	EEPROM	Sub menu data
SDI-23	IC457	E1 (Side A)	EEPROM	SDI board adjustment data
SV-194A	IC403	D8 (Side A)	NV-RAM	Servo data and hours meter data
SW-21	IC20	D1 (Side A)	EEPROM	SW-21 board adjustment data
SY-259B	IC112	E2 (Side A)	NV-RAM	Main menu set data
TG-191	IC406	C4 (Side A)	EEPROM	TG board adjustment data

1-15-1. Initialization and Adjustment

Explains how to initialize and adjust the data when adjustment and set data items are lost during IC replacement.

1. IC703 on EQ-72 board

(1) Perform the automatic adjustment using the A17: A11-A16 ALL ADJUST menu of the maintenance mode.
(For the adjustment, refer to Section 3.)
(2) Set initialize value to A30: EQ VR of the maintenance mode, then adjust it.
(For the setting and adjustment, refer to Section 3.)

2. IC34 on DEC-97 board

(1) Adjust all menu items of the maintenance mode below.
(For the adjustment, refer to Section 3.)
- A24: INPUT CF DETECT
- A25: DEC VR or A26: DEC VR (LOOP)

3. IC909 and IC1812 on DM-114/114P board

• IC909

(1) Set initial values to all menu items of the maintenance mode below, then adjust them.
(For the setting and adjustment, refer to Section 3.)
- A32: DM VR1
- A33: DM VR2
- A34: DM VR3
- A35: DM VR4
- A36: DM VR5

• IC1812

(1) Set initial values to all A37: TBC VR menu items of the maintenance mode, then adjust them.
(For the setting and adjustment, refer to Section 3.)

4. U23 on VFD assembly

(1) Set the sub menu data again.
(For the setting, refer to Section 6 of the operation manual.)

5. IC457 on SDI-23 board

(1) Adjust all A23: SDI VR menu items of the maintenance mode automatically.
(For the adjustment, refer to Section 3.)
- A231: SDI ENC VCO
- A232: SDI DEC VCO
- A2F: NV-RAM CONTROL

6. IC403 on SV-194A board

• Servo adjustment data

(1) Turn on the power while pressing S101 on the SV-194A board and initialize the servo adjustment data.

(2) Adjust all A0: SERVO ADJUST menu items of the maintenance mode.
(For the adjustment, refer to Section 3.)
- A001: S REEL FG DUTY
- A002: CAPSTAN FG DUTY
- A003: CAPSTAN FRICTION
- A004: CAPSTAN FREE SPEED
- A005: RF SWITCHING POS.
- A006: NV-RAM CONTROL

• Hours meter data

(1) The hours meter data is automatically initialized to zero (“0”). The data cannot be restored.

7. IC20 on SW-21 board

• Set the initial value data of the reference voltage at the DC IN connector.

(1) Set the switch S10-2 on the SW-21 board to ON after turning off the power.
(2) Turn on the power again.
(3) Connect the external DC power supply to the DC IN connector on the connector panel, and set the input DC voltage at the DC IN connector to 13.00 V dc.

Note

To prevent the voltage drop caused by the connection cable length connected between the external DC power supply and DC IN connector, use the shorter connection cable as much as possible.

(4) Press the HOLD and MENU buttons on the front panel simultaneously about one second.
By this operation, the reference voltage adjustment at DC IN connector is performed automatically, and WARNING indicator lights up about five seconds.
  • When the adjustment is completed, the WARNING indicator lights off.
  • When the adjustment is failed, WARNING indicator blinks about one second interval. Perform step (4) again.
(5) Turn off the power.
(6) Turn the switch S10-2 on the SW-21 board back to OFF.

• Check of the initial reference voltage data setting

(1) Connect the external DC power supply to the DC IN connector, and then set the voltage to 13.00 V dc.
(2) Turn on the power.
(3) To display the F2 MENU, press the F2 button, and then press the PAGE button on the slide panel. Then set the values for the following items. (Refer to the operation manual, Section 2-7-2 for details.)
  BAT-END : 10.5
  BAT-NE : 11.0
(4) Push the PAGE button to return the display to the home page.
(5) Down the DC voltage of the external DC power supply so that the 1/7 scale on the remaining battery power display blinks.
At this time, check that the input DC voltage at the DC IN connector on the connector panel meets the following specification.
  Specification : 11.0 ±0.1 V
(6) Turn off the power of the unit.

8. IC112 on SY-259B board

(1) Set the setup menu data again.
(For the setting, refer to the operation manual.)

9. IC406 on TG-191 board

(1) Adjust all A20: VPR/TG VR menu items of the maintenance mode.
(For the adjustment, refer to Section 3.)

1-16. PLCC IC Removal

Tool required

It is recommended that the tool below is used to remove the PLCC-type IC inserted into an IC socket.
This tool can be used for IC whose number of pins is 20 to 124.

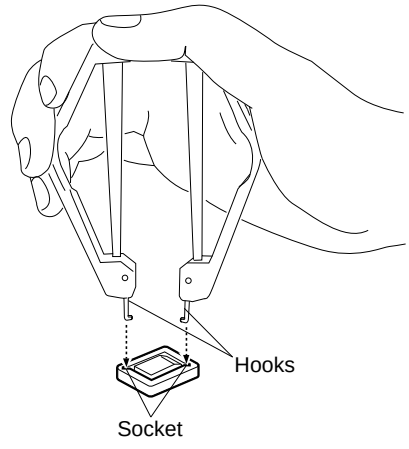
Extraction tool for PLCC socket
Sony part No.: J-6035-070-A

Procedure

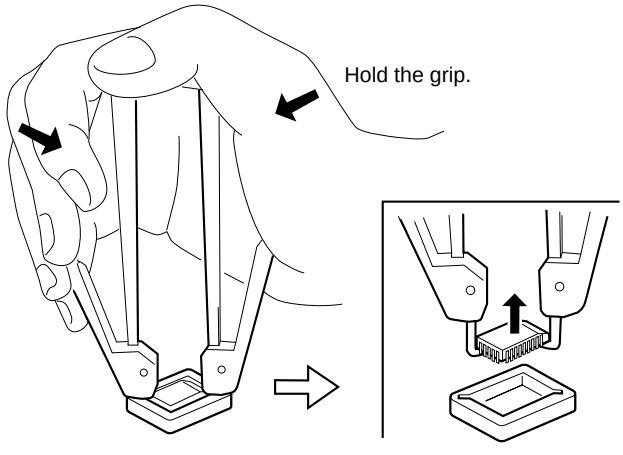
Notes

- Do not pull the IC chip upward using an extraction tool.
- Do not interpose the tool by excessive force.

1. Align the tool hook with the groove of an IC socket, then insert.



2. Hold the grip as shown in the figure and remove the PLCC IC.



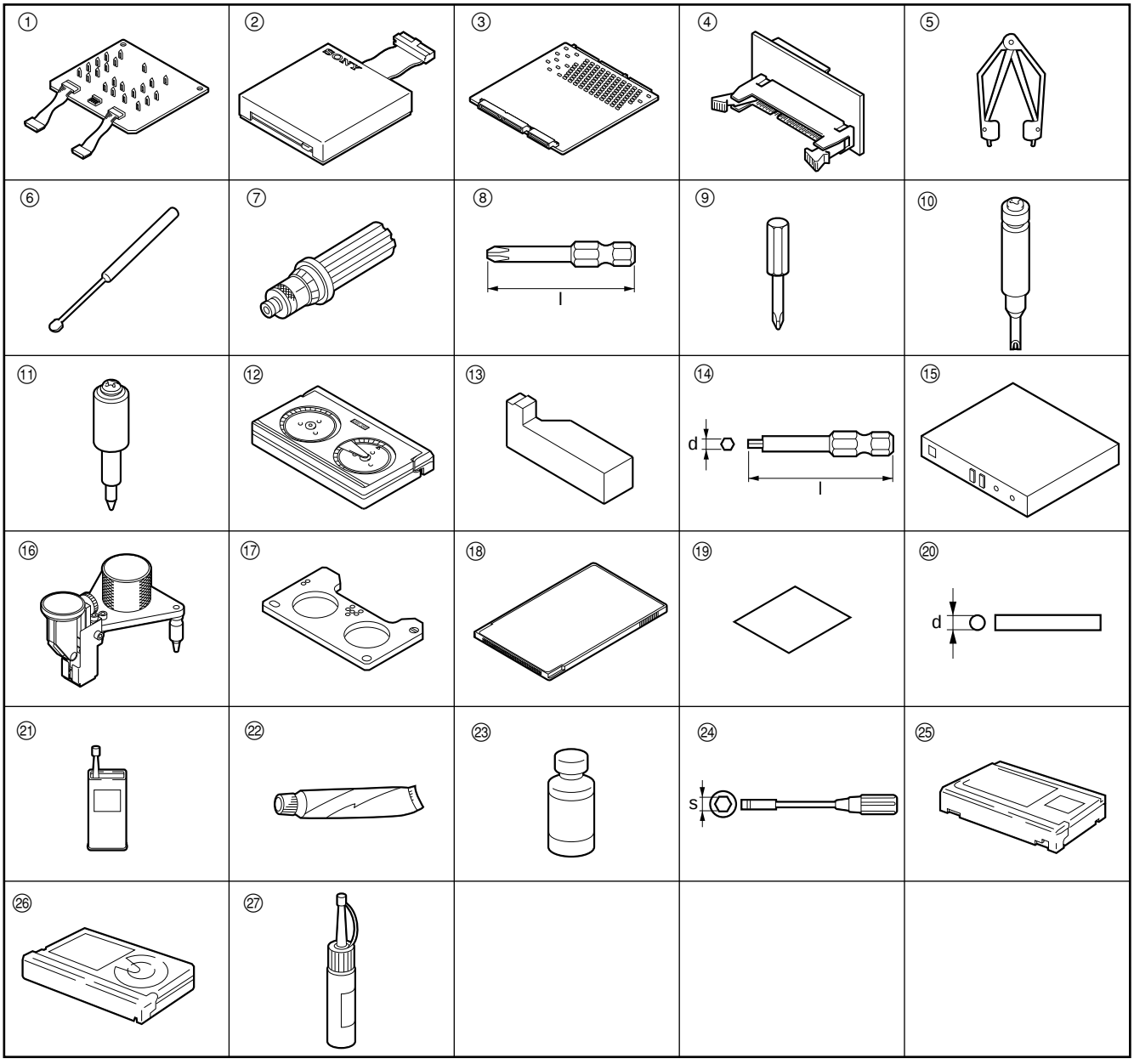
1-17. Fixtures and Adjustment Equipment

1-17-1. Fixtures

Fig.	Part No.	Name	For use
①	A-8317-304-A	HN-257 mounted circuit board	Tape path alignment
②	A-8319-485-A	IC memory card box, CDS-20 assembly	Software update
③	A-8321-000-A	Extension board (EX-706)	Extension of plug-in boards
④	A-8322-838-A	CN-1936 board	Connection of the IC memory card box
⑤	J-6035-070-A	Extraction tool (for PLCC socket)	Extraction of PLCC IC
⑥	J-6080-840-A	Inspection mirror	Tape curl check
⑦	J-6252-510-A	Torque screwdriver (6 kg•cm) {0.6 N•m} [JB-5251]	Tightening screws
	J-6252-520-A	Torque screwdriver (12 kgf•cm) {1.2 N•m} [JB-5252]	Tightening screws
	J-6325-400-A	Torque screwdriver (3 kgf•cm)	Tightening screws (for M1.4 and M2 bit)
⑧	J-6325-110-A	Torque screwdriver bit (for M1.4)	Tightening screws on mech. deck (l = 75 mm)
	J-6323-420-A	Torque screwdriver bit (+2 mm, Cl = 75 mm)	Tightening screws for brush/slip-ring assembly
⑨	J-6325-380-A	Torque screwdriver bit (for M2)	Tightening screws on drum, capstan, reel motor and boards (l = 162 mm)
⑩	J-6322-420-A	Tape guide adjustment driver (45)	Tape guide adjustment
⑪	J-6323-530-A	Stop washer fastening tool	Installation of stop washer
⑫	J-6323-890-A	Torque cassette (FWD BACK TEN.) [MW-389]	FWD back tension REV back tension measurement
⑬	J-6324-150-A	Reel table height adjustment tool [MW-415]	Reel height check
⑭	J-6326-120-A	Hexagon bit (for torque driver)	Tightening screws on mech. deck for installation and removing (d = 1.5 mm, l = 85 mm)
⑮	J-6332-240-A	VISC phase adjusting tool	VISC alignment for PAL system (for DNW-A28P only)
⑯	J-6530-650-A	Head tip protrusion measurement tool	Head tip protrusion check of the video head
⑰	J-7032-610-A	Cassette reference plate	Reel height adjustment
⑱	1-772-004-11	IC memory card (4 MB, MB98A81273)	Software update
⑲	3-184-527-01	Cleaning cloth (15 cm × 15 cm)	Cleaning
⑳	3-649-266-01	Parallel pin (d = 1.6 mm)	Fixing position of cam gear
	3-703-358-04	Parallel pin (d = 2.0 mm)	Fixing position of threading gear/drawing arm when installing
㉑	7-432-114-11	Screw locking compound (200g)	Inhibit loosening screws
㉒	7-651-000-10	Sony grease SGL-601 (50 g)	
	7-651-000-11	Sony grease SGL-801 (50 g)	
	7-651-000-59	Grease (PG-662)	
㉓	7-661-018-18	Diamond oil NT-68 (50 ml)	
㉔	7-700-751-01	Nut driver (s = 4.5 mm)	CTL/AT head height adjustment
㉕	8-960-075-01	Alignment tape, SR5-1	Video/audio alignment (for 525/60 system)
	8-960-075-11	Alignment tape, SR2-1	Servo alignment (for 525/60 system)
	8-960-075-51	Alignment tape, SR5-1P	Video/audio alignment (for 625/50 system)
	8-960-075-61	Alignment tape, SR2-1P	Servo alignment (for 625/50 system)

Fig.	Part No.	Name	For use
㉖	8-960-096-01	Alignment tape, CR2-1B	Tracking alignment (for analog Betacam, NTSC)
	8-960-096-41	Alignment tape, CR5-1B (METAL)	Video alignment (for analog Betacam, NTSC)
	8-960-096-51	Alignment tape, CR2-1B PS	Tracking alignment (for analog Betacam, PAL)
	8-960-096-86	Alignment tape, CR8-1B PS (METAL)	Audio alignment (for analog Betacam, PAL)
	8-960-096-91	Alignment tape, CR5-1B PS (METAL)	Video alignment (for analog Betacam, PAL)
	8-960-097-44	Alignment tape, CR5-2A (OXIDE)	Video alignment (for analog Betacam, NTSC)
	8-960-097-45	Alignment tape, CR8-1A (OXIDE)	Audio alignment (for analog Betacam, NTSC)
	8-960-098-44	Alignment tape, CR5-2A PS (OXIDE)	Video alignment (for analog Betacam, PAL)
	8-960-098-45	Alignment tape, CR8-1A PS (OXIDE)	Audio alignment (for analog Betacam, PAL)
㉗	9-919-573-01	Cleanng	Cleaning

Refer to “1-18. Alignment Tape” for details of the alignment tape.



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1-17-2. Equipment for Adjustment

It is recommended to use the equipment listed below or the equivalents.
Each equipment is available as standard products.

Equipment	Model name	Remarks
Serial digital component video signal generator	Tektronix TSG-422-OP.1S	for generating 4:2:2 format digital signal
Analog composite video signal generator	Tektronix TSG-170A	for 525/60 system
	Tektronix TSG-271A	for 625/50 system
Serial digital component monitor	Tektronix WFM601	
Analog composite waveform / vector monitor	Tektronix 1750 or 1780R	for measuring analog composite signal for 525/60 system
	Tektronix 1751 or 1781R	for measuring analog composite signal for 625/50 system
Oscilloscope	Tektronix 2465B	
Analog component waveform monitor	Tektronix WFM300	for video phase adjustment
Spectrum analyzer	Advantest R3261A	with external trigger function bandwidth: more than 100 MHz
Network analyzer	Anritsu MS420B	
Audio signal generator	Tektronix SG505-OP.02	
Audio analyzer	Tektronix AA501A-OP.02	for measuring distortion and levels
Audio level meter	Hewlett-Packard HP3400A	
Digital voltmeter	Advantest TR6845	
Monitor with serial digital input	Sony BVM-1311 (with optional accessory BKM-2085-14)	for DNW-A28
	Sony BVM-1411 (with optional accessory BKM-2085-14)	for DNW-A28P
Composite video monitor	Sony BVM-14F5U or BVM-14F5E ∗1 OP. BKM-24N OP. BKM-25P	 for 525/60 system for 625/50 system
Terminator	75 Ω BNC type	
Recording tape	Sony Betacam SX tape (BCT-62SXA etc.)	

∗ : Use the composite video monitor that is applicable to the place in the world.

1-18. Alignment Tape

Describes the alignment tapes using for adjusting the unit.

1. SR5-1 (SONY part No. 8-960-075-01): For 525/60 system
SR5-1P (SONY part No. 8-960-075-51): For 625/50 system

Used for video/audio adjustment.

Time (min. : sec.)	Digital video	Digital audio	CTL track
0:00 -	100% color-bars	1 kHz sine wave, –20 dB FS	CTL
2:00 -	100% color-bars	1 kHz sine wave, 0 dB FS	CTL
4:00 -	100% color-bars	–∞ dB FS	CTL
6:00 -	100% color-bars	20 Hz sine wave, –20 dB FS	CTL
8:00 -	100% color-bars	20 kHz sine wave, –20 dB FS	CTL
10:00 -	Ramp	1 kHz sine wave, –20 dB FS	CTL
12:00 -	Ramp	1 kHz sine wave, 0 dB FS	CTL
14:00 -	Ramp	–∞ dB FS	CTL
16:00 -	Ramp	20 Hz sine wave, –20 dB FS	CTL
18:00 -	Ramp	20 kHz sine wave, –20 dB FS	CTL
20:00 -	100% color-bars	1 kHz sine wave, –20 dB FS	CTL
22:00 -	100% color-bars	1 kHz sine wave, 0 dB FS	CTL
24:00 -	100% color-bars	–∞ dB FS	CTL
26:00 -	100% color-bars	20 Hz sine wave, –20 dB FS	CTL
28:00 - 30:00	100% color-bars	20 kHz sine wave, -20 dB FS	CTL

2. SR2-1 (SONY part No. 8-960-075-11) :For 525/60 system
SR2-1P (SONY part No. 8-960-075-61) :For 625/50 system

Used for servo adjustment.

Time (min. : sec.)	Digital video	Digital audio	CTL track
00:00- (Pulse*)	3.212 MHz (A CH only)	SR2-1: 3 kHz, 0 VU	CTL
		SR2-1P:3.15 kHz, 0 VU	
15:00 -	A CH : 3.212 MHz	SR2-1: 3 kHz, 0 VU	CTL
	B CH : 6.424 MHz	SR2-1P:3.15 kHz, 0 VU	
20:00 -	12.848 MHz (All CH)	SR2-1: 3 kHz, 0 VU	CTL
		SR2-1P:3.15 kHz, 0 VU	
25:00 - 27:00	100 % Color Bars. (All CH)	No signal	CTL

∗ When the pulse portion (00:00 to 15:00) is played back, the displayed TC data is interpolated by CTL signal due to no recording on the time code track.

3. CR2-1B (SONY part No. 8-960-096-01) : For analog Betacam, NTSC
CR2-1B PS (SONY part No. 8-960-096-51) : For analog Betacam, PAL

Used for tracking adjustment.

Time (min. : sec.)	Video Track	AFM	LTC track	CTL track
00:00 -28:00	Y : 4 MHz C : 5 MHz	—	7: 3 pulse	CTL

∗ The displayed TC data is interpolated by CTL signal due to the duty 7:3 pulse is recorded on the time code track.

4. CR5-1B (SONY part No. 8-960-096-41): For analog Betacam, NTSC
CR5-1B PS (SONY part No. 8-960-096-91): For analog Betacam, PAL

Used for Betacam video/audio adjustment.

Time (min. : sec.)	Video	AFM*	LAU tracks	CTL track
0:00 -	RF sweep No signal	No signal	No signal	CTL
2:00 -	60 % H sweep (CTDM)	No signal	No signal	CTL
5:00 -	Pulse & Bar (CTDM)	No signal	No signal	CTL
8:00 -	60 % multi-burst	No signal	No signal	CTL
11:00 -	Pulse & Bar No signal	No signal	No signal	CTL
14:00 -	CR5-1B: 75 % color-bar CR5-1B PS:100 % color-bar	400 kHz sine wave with 25 kHz deviation	No signal	CTL
16:30 -	CR5-1B: 75 % color-bar CR5-1B PS: 100 % color-bar	400 kHz sine wave with 75 kHz deviation	No signal	CTL
17:00 -	CR5-1B: 50 % bowtie & 12.5T CR5-1B PS: 50 % bowtie & 10T	No signal	No signal	CTL
19:00 -	Line 17	No signal	No signal	CTL
22:00 -	Quad phase	No signal	No signal	CTL
24:00 -	Flat filed	No signal	No signal	CTL
26:00 -	CR5-1B: 75 % color-bar with Drop-out CR5-1B PS: 100 % color-bar with Drop-out	No signal	No signal	CTL
28:00 - 30:00	Composite V sweep with VISC	No signal	No signal	CTL

5. CR5-2A (SONY part No. 8-960-097-44): For analog Betacam, NTSC
CR5-2A PS (SONY part No. 8-960-098-44): For analog Betacam, PAL

Used for Betacam video adjustment.

Time (min. : sec.)	Video	LAU tracks	CTL track
0:00 -	75 % color-bar	No signal	CTL
3:00 -	60 % multi-burst	No signal	CTL
6:00 -	CR5-2A: 50 % bowtie & 12.5T CR5-2A PS: 50 % bowtie & 10T	No signal	CTL
9:00 -	Pulse & Bar	No signal	CTL
11:00 -	Quad phase	No signal	CTL
13:00 - 15:00	Composite monoscope (Switching position is shifted.)	No signal	CTL

6. CR8-1A (SONY part No. 8-960-097-45): For analog Betacam, NTSC
CR8-1A PS (SONY part No. 8-960-098-45): For analog Betacam, PAL

Used for Betacam audio adjustment.

Time (min. : sec.)	LAU tracks	CTL track	Video
0:00 -	1 kHz sine wave, 0 VU	CTL	No signal
2:55 -	No signal	CTL	No signal
3:00 -	10 kHz sine wave, –10 VU	CTL	No signal
4:55 -	No signal	CTL	No signal
5:00 -	1 kHz sine wave, –20 VU	CTL	No signal
5:55 -	No signal	CTL	No signal
6:00 -	40 Hz sine wave, –20 VU	CTL	No signal
6:25 -	No signal	CTL	No signal
6:30 -	7 kHz sine wave, –20 VU	CTL	No signal
6:55 -	No signal	CTL	No signal
7:00 -	10 kHz sine wave, –20 VU	CTL	No signal
7:25 -	No signal	CTL	No signal
7:30 -	15 kHz sine wave, –20 VU	CTL	No signal
7:55 -	No signal	CTL	No signal
8:00 - 10:00	1 kHz sine wave, 0 VU	1 kHz sine wave, 0 VU	No signal

7. CR8-1B PS (SONY part No. 8-960-096-86): For analog Betacam, PAL

Used for Betacam audio adjustment.

Time (min. : sec.)	LAU tracks	CTL track	Video	AFM
0:00 -	1 kHz sine wave, 0 VU	CTL	No signal	No signal
2:55 -	No signal	CTL	No signal	No signal
3:00 -	15 kHz sine wave, 0 VU	CTL	No signal	No signal
4:55 -	No signal	CTL	No signal	No signal
5:00 -	1 kHz sine wave, –20 VU	CTL	No signal	No signal
5:55 -	No signal	CTL	No signal	No signal
6:00 -	40 Hz sine wave, –20 VU	CTL	No signal	No signal
6:25 -	No signal	CTL	No signal	No signal
6:30 -	7 kHz sine wave, –20 VU	CTL	No signal	No signal
6:55 -	No signal	CTL	No signal	No signal
7:00 -	10 kHz sine wave, –20 VU	CTL	No signal	No signal
7:25 -	No signal	CTL	No signal	No signal
7:30 -	15 kHz sine wave, –20 VU	CTL	No signal	No signal
7:55 - 8:00	No signal	CTL	No signal	No signal

1-19. Setup Menu

This section explains the items on the setup menu, which are for use during adjustment or maintenance. For details on ITEM-H00 to ITEM-900 and ITEM-B00 series items, refer to the operation manual.

1-19-1. Menu Operation

Preparation

The menus for ITEM-F series items are usually not accessible. To display them, internal switch setting for the SY-259B board is required. For details on the switch function, refer to Section 1-8.

• S201-1/SY-259B board ⇨ ON

Note

The menus for ITEM-F series items are exclusively for adjustment. After adjustment is completed, be sure to turn the switch back to OFF.

Activating the menu

1. Press the MENU button.
2. Turn the JOG dial while pressing the PLAY button.

Basic operation

. To select ITEM

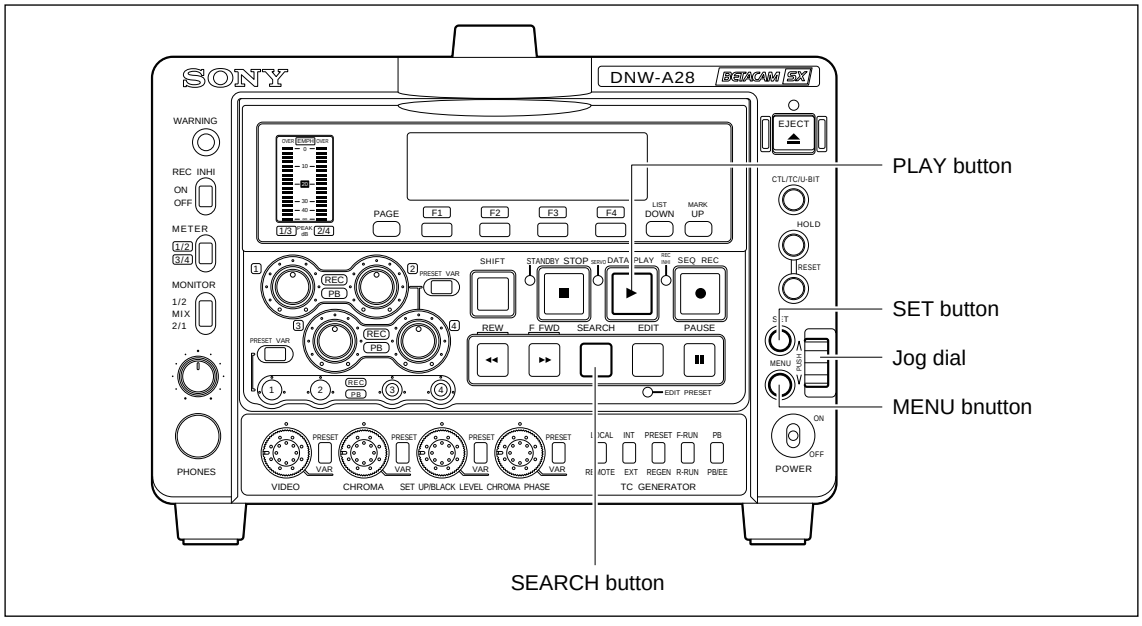
Turn the JOG dial while pressing the PLAY button to move the cursor to the desired ITEM.

. To change DATA

Press the SEARCH button to open the window for setting change. Turn the JOG dial and change the setting value.

. To enter the setting value

Press the SET button.



1-19-2. F-Series items

ITEM		DATA		Description
No.	**ITEM**	**No.**	**DATA**	
F01	AUDIO NR IN SP MODE	ON 1	[on] switch select	**Note** This item is used exclusively for analog Betacam longitudinal audio playback adjustment for 625/50 system After adjustment is completed, return to the factory setting “ON(on)” Turns on and off the Dolby NR when using a metal tape ON: Dolby NR is turned on usually 1: Dolby NR is turned on and off depending on the setting of the sub menu (in Audio setting page) **Note** When using an oxide tape, follows the sub menu setting regardless of the above setting
F02	EMERGENCY TAPE PROTECTION	ENA DIS	[enable] disable	**Note** This item is used exclusively for servo and mechanical adjustment After adjustment is completed, return to the factory setting “ENA (enable)” Selects whether emergency tape protection operation is enabled or not when VTR detects error in tape transport mechanism ENA: Tape protection operation is enabled DIS: Tape protection operation is disabled
F13	TRACKING CONTROL VIA SEARCH DIAL	OFF ON	[off] on	**Note** This item is used exclusively for video tracking adjustment After adjustment is completed, return to the factory setting “OFF (off)” Turns on and off the tracking control operation with JOG dial OFF: Tracking control with JOG dial is not activated ON: Tracking control becomes active when turning JOG dial in PLAY mode
F16	DEVICE TYPE NO MODIFY:0H	0 1 | FFFF	[0] 1 | FFFF	Determines response data to 9-pin remote command DEVICE TYPE REQUEST (00h, 11h) 0: Returns the original device type data of the unit Except 0: Returns the set values as they are: The higher-order two digits are for DATA-1 The lower-order two digits are for DATA-2 **Note** Any selection of the above does not influence the whole VTR operation in DNW-A28 If this item is set to values other than the factory-setting (DATA:0000), the operation of the unit is not ensured under the 9-pin remote command control.
F21	PROCESS CONT VR LOCAL ENABLE	OFF ON	[off] on	Selects whether sub menu setting (in Video setting page) is enabled or not, when LOCAL DISABLE command is received through the 9-pin remote connector or the setup menu “006: LOCAL FUNCTION ENABLE” is set to “all disable” OFF: Settings of sub menu is disabled ON: Settings of sub menu is enabled

1-19-3. Switching between 525/625 Line Systems (Menu Item 013)

In this section, describes the 525 or 625 line system selection method.

Note

To display the menu item on the video monitor connected to the VIDEO OUTPUT 2 (SUPER) connector on the connector panel, set the unit as follows;

(1) To display the F2 MENU, press the F2 button, and then press the PAGE button on the slide panel.
(2) Set the “SUPER” on the sub menu to MENU, and push the MENU button.

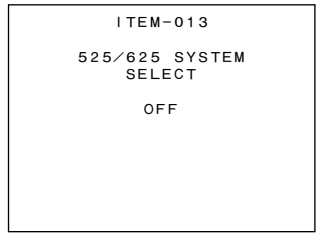
525/625 line system selection

Note

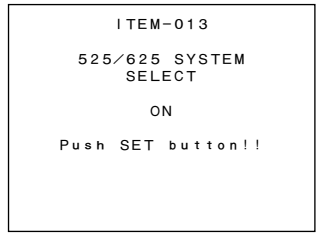
Fig.1 to Fig.5 are the examples of the video monitor indication for the system selection from 525 to 625.

1. Turn the JOG dial, and select the basic menu item 013.
2. Push the JOG dial. (Fig.1)
3. Turn the JOG dial to change the setting from OFF to ON, then push the JOG dial. (Fig.2)
4. Push the SET button. (Fig. 3)
5. Turn the JOG dial to change the setting 525 or 625, and then push the JOG dial. (Fig. 4)
6. Push the SET button. (Fig.5)
7. Turn off the power switch, and then turn it back to on.

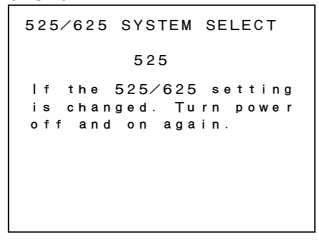
(Fig.1)



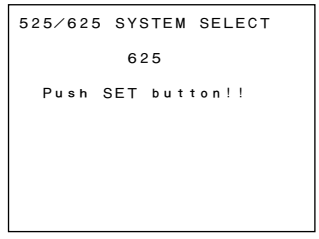
(Fig.2)



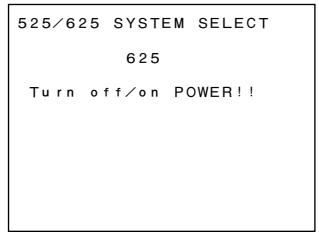
(Fig.3)



(Fig.4)



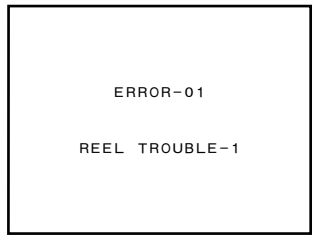
(Fig.5)



Section 2
Error Messages

2-1. Overview of Error Messages

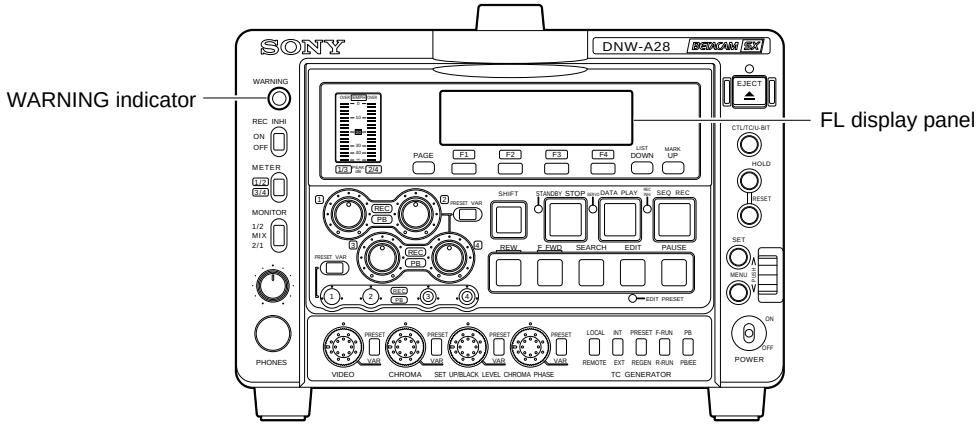
This unit has self-diagnostics function.
When trouble is detected, an WARNING indicator at the left side of the front panel is lighted immediately, and an error message is displayed on the FL display panel. Also, an error code and error message are superimposed on the video monitor connected to the VIDEO OUTPUT 2 (SUPER) connector. Furthermore, as for the some error codes, object which error occurred is displayed as sub error message on the video monitor.



A sample of Superimposed Video Monitor

Notes

- To superimpose the error message on the video monitor, set the SUPER item to ON by using the general setting page of the sub menu. (For sub menu, refer to the operation manual.)
- There are the error messages without error code. These messages are only displayed on the FL display panel.
- The error messages with error code are memorized to NV-RAM (Non-volatile RAM) as the error logging data.
  (Refer to Section 3 for the error logging data.)
- The messages on the FL display panel differ from the messages which are superimposed on the video monitor in some items.



FL display panel and WARNING Indicator

Error messages are described on Section 2-2 in the order of list.

Error List

Code	FL display panel	Page	Description
01	REEL TROUBLE	2-4	Tape slacking is detected in the unthreading operation.
02	REEL TROUBLE	2-5	Tape slacking or tape breaking is detected in the SEARCH, FF, or REW mode.
03	REEL TROUBLE	2-6	Tape slacking, or tape breaking is detected in the REC or PLAY mode.
04	REEL TROUBLE	2-7	An malfunctional tape transport speed is detected in the FF or REW mode.
06	TAPE TENSION	2-7	Excessive tape tension is detected in the REC or PLAY mode.
07	CAPSTAN TROUBLE	2-8	Abnormal capstan motor rotation speed was detected in the REC, PLAY, SEARCH, or REW mode. Malfunction of capstan FG was detected in the REC or PLAY mode.
08	DRUM TROUBLE	2-8	Malfunction of drum motor is detected.
09	TH/UNTH MOTOR	2-9	Malfunction of threading or unthreading operation is detected.
10	HUMID	2-9	Dew condensation is detected.
12	TAPE TOP SENSOR	2-10	Malfunction of tape top sensor is detected.
13	TAPE END SENSOR	2-10	Malfunction of tape end sensor was detected.
14	FAN MOTOR	2-11	Malfunction of cooling fan motor is detected.
40	DPR-87 BOARD 1	2-11	The abnormal operation of IC on DPR-87 board was detected.
43	DPR-87 BOARD 4	2-12	The abnormal operation of IC (SDRAM) on DPR-87 board was detected.
92	INTERNAL I/F 1	2-12	Abnormality in the interface between SYS1 CPU (on SY-259B board) and other CPU/MPU is detected.
93	CPU INITIALIZE	2-13	Abnormality was detected in the communication between SERVO CPU (SV-194A board) and DRUM MICOM (SV-194A board).
96	SY NV-RAM ERROR	2-13	The abnormal operation of an NV-RAM (on SY-259B board) for the system control system is detected.
97	SV NV-RAM	2-14	The abnormal operation of an NV-RAM (on SV-194A board) for the servo system is detected.
98	RF NV-RAM ERROR	2-14	The abnormal operation of an NV-RAM (on EQ-72, or DM-114/114P board) for the RF system is detected.
99	INTERNAL I/F 2	2-15	Abnormality in the interface between SYS2 CPU (on SY-260 board) and SERVO CPU (on SV-194A board) or MPU (on EQ-72, DM-114/114P, or SDI-23 board) is detected.

Notes

- Error codes 01 through 13 detect in the SV-194A board.
  Error code 14 detects in the SY-259B board.
  Error codes 40 through 43 detect in the SY-260 board.
  Error codes 92 through 99 detect in the SY-259B and/or SY-260 board.
- There are two error groups of error codes: VTR and OTHERS. If errors occur in multiple error groups, the error message of each group are switched at two-second intervals.
  Also, if multiple errors occur in error group, the priority level of each group display are as follows:
  VTR: 97, 02, 03, 04, 07, 06, 01, 09, 08, 10, 12, 13, 14
  OTHERS: 92, 96, 98, 99, 93, 40, 43

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2-2. Details of Error Messages

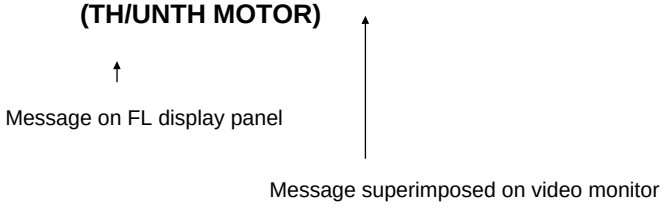
CAUTION

The “protection mode” described in this section means the servo control system automatically stops the tape transport and drum motor rotation, and maintains this state. The DNW cannot be automatically recovered to the normal state when the DNW once enters the protection mode. Be sure to turn the power on again under the absence of the cassette tape.
If the protection mode is entered with the cassette tape inserted, take out the cassette tape manually with reference to “1-10. How to Take Out the Cassette whose Tape is Slacked”. Never turn the power on again before taking out the cassette tape. This may damage the tape.

Note

The messages on the FL display panel differ from the messages which are superimposed on the video monitor in some items. In this section, each message indicates as following example.

Ex. : ERROR-09 TH/UNTH MOTOR TIME OUT
(TH/UNTH MOTOR)



ERROR-01 REEL TROUBLE - 1 (REEL TROUBLE)

Description : Tape slacking was detected during unthreading.

Detecting conditions : When no take-up reel FG can be detected in the unthread operation.

Sub error message : None

Possible causes :

- Cassette compartment trouble or installation defect
  - ✻ The reel did not rotate because the cassette was lifted-up from the specified position.
- FG sensor trouble in take-up reel
- Take-up reel FG waveform shaper circuit (SV-194A board) trouble
- Take-up reel brake trouble
- Harness disconnection
- Take-up reel table height adjustment defect

Protecting operation : Enters the protection mode.

CAUTION

Be sure to take out the cassette manually (refer to Section 1-10). Do not turn the power on again before taking out the cassette. This may damage the tape.

ERROR-02 REEL TROUBLE - 2 (REEL TROUBLE)

Description : Tape slacking or tape breaking was detected in SEARCH, FF, or REW mode.

Detecting conditions :
1) When the take-up value is lower than the specified value with respect to the tape supply value.
2) When the detect voltage of the supply tension sensor is lower than the specification continuously for some seconds.
3) When the supply reel and take-up reel do not coincide in rotation direction continuously for more than five seconds.

Sub error message : None

Possible causes :
- Cassette compartment trouble or installation defect
  - ∗ The reel did not rotate because the cassette was lifted-up from the specified position.
- FG sensor trouble in supply reel motor or take-up reel
- Supply reel FG waveform shaper circuit (SV-194A board) trouble
- Supply or take-up reel motor trouble
- Supply reel motor drive circuit (SV-194A board) trouble
- Capstan motor trouble
- Capstan motor drive circuit (SV-194A board) trouble
- Capstan FG waveform shaper circuit (SV-194A board) trouble
- Take-up torque insufficiency during REW due to supply tension sensor or supply tension detect circuit (SR-65 board) trouble
- Servo adjustment defect on capstan, reel, and supply tension sensor
- Supply reel brake trouble
- Supply reel brake solenoid drive circuit (SV-194A board) trouble
- Harness disconnection
- Reel table height adjustment defect
- Tape path and drum troubles
- Tape abnormality (The winding state has a problem.)

Protecting operation : Enters the protection mode. The normal state may be returned after the protection mode is entered at the end of the tape.

CAUTION

Be sure to take out the cassette manually (refer to Section 1-10). Do not turn on the power again before taking out the cassette. This may damage the tape.

ERROR-03 REEL TROUBLE - 3 (REEL TROUBLE)

Description : Tape slacking, or tape breaking was detected in the REC or PLAY mode.

Detecting conditions :
1) When the take-up value is lower than the specified value with respect to the tape supply value.
2) When the tension value calculated from the supply tension sensor output is less than 15 g continuously for more than three seconds.
3) When the supply reel and take-up reel do not coincide in rotation direction continuously for more than five seconds.

Sub error message : None

Possible causes :
- Cassette compartment trouble or installation defect
  - ✻ The reel did not rotate because the cassette was lifted-up from the specified position.
- FG sensor trouble in supply reel motor or take-up reel
- Supply or take-up reel FG waveform shaper circuit (SV-194A board) trouble
- Supply reel motor trouble
- Supply reel motor drive circuit (SV-194A board) trouble
- Capstan motor trouble
- Capstan motor drive circuit (SV-194A board) trouble
- Capstan FG waveform shaper circuit (SV-194A board) trouble
- Servo adjustment defect on capstan, reel, and supply tension sensor
- Supply reel brake trouble
- Supply reel brake solenoid drive circuit (SV-194A board) trouble
- Harness disconnection
- Reel table height adjustment defect
- Tape path and drum troubles
- Tape abnormality (The winding state has a problem.)

Protecting operation : Stop the tape transport and enters the rest state.

CAUTION

Be sure to take out the cassette manually (refer to Section 1-10). Do not turn on the power again before taking out the cassette. This may damage the tape.

ERROR-04 REEL TROUBLE - 4 (REEL TROUBLE)

Description : Abnormal tape transport speed was detected in the FF mode.

Detecting condition : When the tape speed calculated from the supply reel FG and take-up reel FG is under a half of the specified tape speed continuously for more than ten seconds.

Sub error message : None

Possible causes :
- Cassette compartment trouble or installation defect
  - ∗ The reel did not rotate because the cassette was lifted-up from the specified position.
- FG sensor trouble in supply reel motor or take-up reel
- Supply reel motor trouble
- Supply or take-up reel FG waveform shaper circuit (SV-194A board) trouble
- Supply reel motor drive circuit (SV-194A board) trouble
- Servo adjustment defect on supply or take-up reel
- Supply or take-up reel brake trouble
- Supply reel brake solenoid drive circuit (SV-194A board) trouble
- Harness disconnection
- Reel table height adjustment defect
- Tape path and drum troubles
- Tape abnormality (The winding state has a problem.)

Protecting operation : Stops the tape transport and enters the rest state.

ERROR-06 TAPE TENSION ERROR (TAPE TENSION)

Description : Excessive tension was detected in the REC or PLAY mode.

Detecting condition : When the tension value calculated from supply tension sensor output is more than 55 g continuously for more than three seconds.

Sub error message : None

Possible causes :
- Cassette compartment trouble or installation defect
  - ∗ The reel did not rotate because the cassette was lifted-up from the specified position.
- Supply tension sensor or its related circuit (SV-194A board) trouble
- Supply reel motor trouble
- Supply reel motor drive circuit (SV-194A board) trouble
- Servo adjustment defect on supply reel and supply tension sensor
- Supply reel brake trouble
- Supply reel brake solenoid drive circuit (SV-194A board) trouble
- Harness disconnection

Protecting operation : Stops the tape transport and enters the rest state.

ERROR-07 CAPSTAN TROUBLE (CAPSTAN TROUBLE)

Description : Abnormal capstan motor rotation speed was detected in the REC, PLAY, SEARCH, or REW mode.
Malfunction of capstan FG was detected in the REC or PLAY mode.

Detecting conditions :
1) When the capstan motor ratation speed is under a half of the specified speed continuously for more than four seconds.
2) When the frequency calculated from the capstan FG is out of the specification in the REC, or PLAY mode.

Sub error message : None

Possible causes :
- Capstan motor trouble
- FG sensor trouble in capstan motor
- Capstan motor drive circuit (SV-194A board) trouble
- Capstan motor FG waveform shaper circuit (SV-194A board) trouble
- Capstan FG duty adjustment defect

Protecting operations : Stops the tape transport and enters the rest state.

ERROR-08 DRUM TROUBLE (DRUM TROUBLE)

Description : Malfunction of drum motor was detected.

Detecting condition :
1) When the drum FG is not detected for more than 0.2 seconds.
2) When the drum rotation speed is over 90 rotations per second, and this condition continues and accumulates about three seconds within ten seconds.
3) When the drum rotation speed is under the specified.

Sub error message : None

Possible causes :
- Drum motor trouble
- Drum microcomputer (IC212 on SV-194A board) trouble
- Drum motor drive circuit (SV-194A board) trouble
- Drum FG/PG waveform shaper circuit (SV-194A board) trouble
- Assembly defect during upper drum replacement

Protecting operation : Stops the tape transport and enters the rest state.

ERROR-09 TH/UNTH MOTOR TIMEOUT (TH/UNTH MOTOR)

Description : Malfunction of threading or unthreading operation was detected.

Detecting conditions :
1) When condition of the function cam sensors are not shifted more than four seconds in other status of threading end or unthreading end.
2) When the mode shift of the function cam sensors are abnormal state.

Sub error message : None

Possible causes :
- Threading motor trouble
- Threading motor drive circuit (SV-194A board) trouble
- Threading mechanism trouble
- Function cam sensor trouble

Protecting operations : Enters the protection mode during tape threading/unthreading.
Stops the tape transport and enters the rest state in cases except the above.

ERROR-10 HUMID (HUMID)

Description : Dew condensation was detected.

Detecting condition : When the condensation sensor detects dew condensation continuously for about two seconds.

Sub error message : None

Possible causes :
- Actual dew detection (When the operating environment rapidly changes from low temperature to high temperature and high humidity)
- Condensation sensor trouble
- Dew input port (IC401 on SV-194A board) trouble

Protecting operations : Stops the drum rotation or prohibits the rotation of drum.
Prohibits the cleaning roller operation.
Stops the tape transport and enters the rest state in the unthread end state when the tape is threaded in states other than PLAY and REC mode.
Prohibits the tape threading.

Note

When this sensor detects due condensation once, the error message will be displayed for about 40 minutes even if a dry state is detected later.

ERROR-12 TAPE TOP SENSOR TROUBLE (TAPE TOP SENSOR)

Description : Malfunction of tape top sensor was detected.

Detecting condition : When the tape top is detected continuously for more than seven seconds.

Sub error message : None

Possible causes :
- Tape top sensor trouble
- Tape top detection circuit (SV-194A board) trouble
- Tape top input port (IC116 on SV-194A board) trouble
- Harness disconnection
- The tape cannot move at the tape top due to troubles other than the tape sensor.

Protecting operations : Stops the tape transport and enters the rest state during tape transport.

ERROR-13 TAPE END SENSOR TROUBLE (TAPE END SENSOR)

Description : Malfunction of tape end sensor was detected.

Detecting condition : When the tape end is detected continuously for more than seven seconds.

Sub error message : None

Possible causes :
- Tape end sensor trouble
- Tape end detection circuit (SV-194A board) trouble
- Tape end input port (IC116 on SV-194A board) trouble
- Harness disconnection
- The tape cannot move at the tape end due to troubles other than the tape sensor.

Protecting operations : Stops the tape transport and enters the rest state during tape transport.

ERROR-14 FAN MOTOR TROUBLE (FAN MOTOR)

Description : Malfunction of cooling fan motor was detected.

CAUTION

If this error occurred, stop immediately operation of the unit, and turn off the power.
If the unit uses continuously under the fan is stopped state, overhearting inside the unit can cause a fire or a failure.

Detecting condition : When the fan motor FG frequency is less than 60% of the specified value.

Sub error message : None

Possible causes :
- Fan motor trouble
- Fan motor FG input port (SY-259B board) trouble
- Harness disconnection

Protecting operation : None

ERROR-40 DPR-87 BOARD ERROR 1 INITIALIZE CHECK (DPR-87 BOARD 1)

Description : The abnormal operation of IC on the DPR-87 board was detected.

Detecting condition : When turning on the power, the diagnostics of each IC detects abnormalities.

Sub error message :
F-CONT
DIGI FIL
SX ENC
SX MEP
ECC ENC
OUTER
SX DEC

As for diagnostics of the DPR-87 board, refer to section 3-2-4 (menu number : C24).

Protecting operation : Displays only this error.

ERROR-43 DPR-87 BOARD ERROR 4 SDRAM CHECK (DPR-87 BOARD 4)

Description : The abnormal operation of IC (SDRAM) on the DPR-87 board was detected.

Detecting condition : When turning on the power or shifting the operation mode, the diagnostics of each IC detects abnormalities.

Sub error message : SX ENC
SX MEP
SX DEC

As for diagnostics of the DPR-87 board, refer to Section 3-2-4 (menu number : C24).

Protecting operation : Displays only this error.

ERROR-92 INTERNAL INTERFACE ERROR 1 (INTERNAL I/F 1)

Description : Abnormality was detected in the communication between SYS1 CPU (IC106 on SY-259B board) and other CPU/MPU.

Sub error messages and Detecting conditions:

SY2 : When the SYS2 CPU (IC108 on SY-260 board) initialization at turn on the power is in abnormal state.

KY : When the communication with MPU (U30 on VFD assembly) is in abnormal state.

DP : When the communication with MPU (IC11 on SW-21 board) is in abnormal state.

Possible causes :

SY2 :
- DIP switch (S201 on SY-260 board) setting defect
- Common RAM (IC400 on SY-259B board) or I/F bus circuit (IC402 through IC404) trouble
- System control system (IC451 through IC455 on SY-260 board) trouble

KY :
- Cable (between SW-21 board and VFD assembly) connection defect or disconnection
- Interface circuit (IC206 on SY-259B board) trouble
- Line receiver/transceiver (U21 on VFD assembly) trouble
- VFD assembly's MPU (U30) trouble
- Cable (between MB-757A board and SW-21 board) connection defect or disconnection

DP :
- Cable (between MB-757A board and SW-21 board) connection defect or disconnection
- Interface circuit (IC209, IC307 and IC308 on SY-259B board) trouble
- VFD assembly's MPU (U30) trouble
- SW-21 board's MPU (IC11) trouble

Protecting operations : When the sub error message is "**SY2**", enters the protection mode.
When it is except above, displays only this error.

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ERROR-93 INITIALIZE ERROR (CPU INITIALIZE)

Description : Abnormality was detected in the communication between SERVO CPU (IC103 on SV-194A board) and DRUM MICOM (IC212 on SV-194A board).

Detecting condition : When turning on the power or during operation, communication error was detected.

Sub error message and detecting condition :

DRUM : When the communication with DRUM MICOM (IC212 on SV-194A board) is in abnormal state.

Possible causes :

- MICOM control interface circuit (IC100 and IC108 on SY-259B board) trouble
- DRUM MICOM (IC212 on SV-194A board) trouble

Protecting operation : Displays only this error.

ERROR-96 SY NV-RAM ERROR (SY NV-RAM ERROR)

Description : The operation error of an NV-RAM (IC112 on SY-259B board) for the system control system was detected.

Sub error messages and Detecting conditions :

CURRENT SETUP : When the data error occurs in the setup menu current memory area during the data write or read .

SETUP BANK1 : When the data error occurs in the setup menu bank 1 memory area during the data write or read.

SETUP BANK2 : When the data error occurs in the setup menu bank 2 memory area during the data write or read.

SETUP BANK3 : When the data error occurs in the setup menu bank 3 memory area during the data write or read.

SETUP BANK4 : When the data error occurs in the setup menu bank 4 memory area during the data write or read.

ID CODE : When the data error occurs in the ID code memory area during the data write or read.

CALENDAR CLOCK : When the calendar/clock function was stopped.

Possible causes :

- NV-RAM (IC112 on SY-259B board) trouble
- Address decoder (IC117 on SY-259B board) trouble
- Backup battery inside NV-RAM is out of life

Protecting operations : When the error occurs in setting data of the setup menu, resets those data to the factory settings.
When the error occurs in ID data, resets the data to 00 00 00 00.
When the error occurs at the calendar/clock function, resets the date and time data to ’96 11 01 00 00 00 (Year, Month, Day, Hour, Minute, Second).

ERROR-97 SV NV-RAM ERROR (SV NV-RAM)

Description : The operation error of an NV-RAM (SV-194A board) for the servo system was detected.

Detecting condition : When the checksum of NV-RAM data does not coincide during activation.

Sub error message : None

Possible cause : NV-RAM (IC114 on SV-194A board) trouble

Protecting operation : Enters the protection mode

ERROR-98 RF NV-RAM ERROR (RF NV-RAM ERROR)

Description : The operation error of an NV-RAM (EQ-72 or DM-114/114P board) for RF system was detected.

Sub error messages and Detecting conditions :

EQ : When the error occurs in an NV-RAM (IC703 on EQ-72 board) during the data write or read.

DM : When the error occurs in an NV-RAM (IC909 on DM-114/114P board) during the data write or read.

TBC : When the error occurs in an NV-RAM (IC1812 on DM-114/114P board) during the data write or read.

Possible causes : Trouble of an NV-RAM indicated by sub error message

Protecting operation : None

ERROR-99 INTERNAL INTERFACE ERROR 2 (INTERNAL I/F 2)

Description : Abnormality was detected in the communication between SYS2 CPU (IC108 on SY-260 board) and SERVO CPU (SV-194A board) or MPU (on EQ-72, DM-114/114P, or SDI-23 board).

Sub error messages and Detecting conditions :

SV : When the SERVO CPU (IC401 on SV-194A board) initialization at turn on the power is in abnormal state.

EQ : When the communication with EQ-72 board's MPU (IC708) is in abnormal state.

DM : When the communication with DM-114/114P board's MPU (IC908) is in abnormal state.

TBC : When the communication with DM-114/114P board's MPU (IC1808) is in abnormal state.

DIF : When the communication with SDI-23 board's MPU (IC455) is in abnormal state.

Possible causes :

SV :
- DIP switch (S100 on SV-194A board) setting defect
- Common RAM (IC300 on SV-194A board) trouble
- Servo system (on SV-194A board) trouble

EQ :
- MPU control interface circuit (IC402, IC459 and IC460 on SY-260 board) trouble
- Interface buffers (IC702 and IC704 on EQ-72 board) trouble
- EQ-72 board's MPU (IC708) trouble

DM :
- MPU control interface circuit (IC402, IC459 and IC460 on SY-260 board) trouble
- DM-114/114P board's MPU (IC908) trouble

TBC :
- MPU control interface circuit (IC402, IC459 and IC460 on SY-260 board) trouble
- DM-114/114P board's MPU (IC1808) trouble

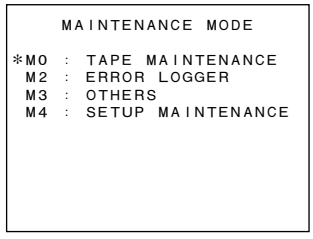
DIF :
- MPU control interface circuit (IC402, IC459 and IC460 on SY-260 board) trouble
- SDI-23 board's MPU (IC455) trouble

Protecting operations : When the sub error message is "**SV**", enters the protection mode.
When it is except above, displays only this error.

Section 3
Maintenance Mode

3-1. Overview of Maintenance Mode

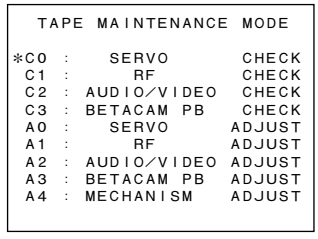
This unit has the maintenance mode that is useful during maintenance and trouble diagnosis.
This maintenance mode consists of the four modes below.
The contents of the maintenance mode are superimposed on the video monitor connected to the VIDEO OUTPUT 2 (SUPER) connector.
To superimpose the contents of the maintenance mode, set the SUPER item on the general setting page of the sub menu to ON. (As for the sub menu, refer to the operation manual.)



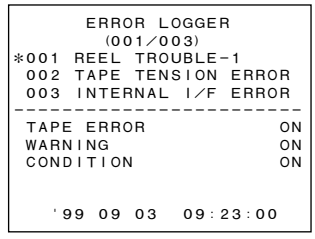
(Mode screen during activation of maintenance mode)

Note
The typeface of characters displayed on the video monitor differs from the actual one.

M0 : TAPE MAINTENANCE ..... (Section 3-2)
This mode is used for maintenance of a VTR part.
In this manual, explains tape maintenance items for adjustment only.

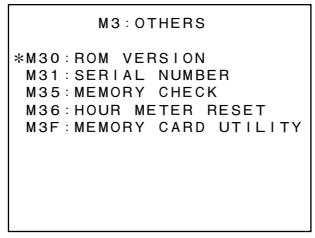

TAPE MAINTENANCE MODE
*C0 : SERVO CHECK
C1 : RF CHECK
C2 : AUDIO/VIDEO CHECK
C3 : BETACAM PB CHECK
A0 : SERVO ADJUST
A1 : RF ADJUST
A2 : AUDIO/VIDEO ADJUST
A3 : BETACAM PB ADJUST
A4 : MECHANISM ADJUST

M2 : ERROR LOGGER ..... (Section 3-3)
This mode is used to display the record of errors (error logging) that occur in this unit.

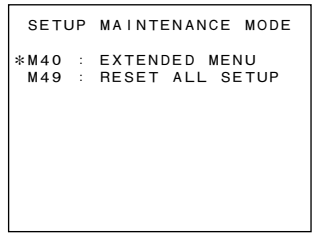


Note
The display on the left is one of the displayed examples.

M3 : OTHERS ..... (Section 3-4)
This mode is used for checking the others.



M4 : SETUP MAINTENANCE ..... (Section 3-5)
This mode is used for the setup menu.



Buttons and Switches for Operation

The main buttons and switches related to the operation of maintenance mode are as follows : The ordinary functions of these buttons and switches and how to use them are described below.

① FL display panel
The menu (mode) No., menu title, selection item, status, or data is displayed on the FL display panel. The menu (mode) No. or selection item block blinks while the menu (mode) or selection item is selected (not including the servo menu in the TAPE maintenance mode). For manual adjustment, the data block blinks. In the state where the tape operation (PB, REC, F FWD, and REW) can be performed, it functions as an ordinary time counter.
There is a menu (mode) that contains insufficient information displayed on this (fluorescent) FL display panel. Since the information displayed on the video monitor is easier to operate and check, usually connect the video monitor to the VIDEO OUTPUT 2 (SUPER) connector.

② MENU button
Push this button in the maintenance mode to return to the screen (state) preceding by one step.
The maintenance mode is terminated if this button is pushed when the mode screen is displayed (mode No. M0, M2, M3 or M4 blinks in a FL display panel).

③ SET button
Push this button in the maintenance mode to select or execute the menu (mode) selected using a ⑦ JOG dial.
The maintenance mode can be activated when this SET button is pushed while pressing the ④ CTL/TC/U-BIT button in the setup menu mode with ⑨ DIP switch S201-2 on the SY-259B board set to ON (upper).

④ CTL/TC/U-BIT button
The maintenance mode can be activated when the ③ SET button is pushed while pressing this button in the setup menu mode with ⑨ DIP switch S201-2 on the SY-259B board set to ON (upper).

⑤ RESET button
Push this button in the error logger mode to erase the recorded error log.

⑥ STOP button
The data value of an electronic volume control can be displayed only while the STOP button is pressed in RF system automatic adjustment menu (A1 : RF ADJUST).

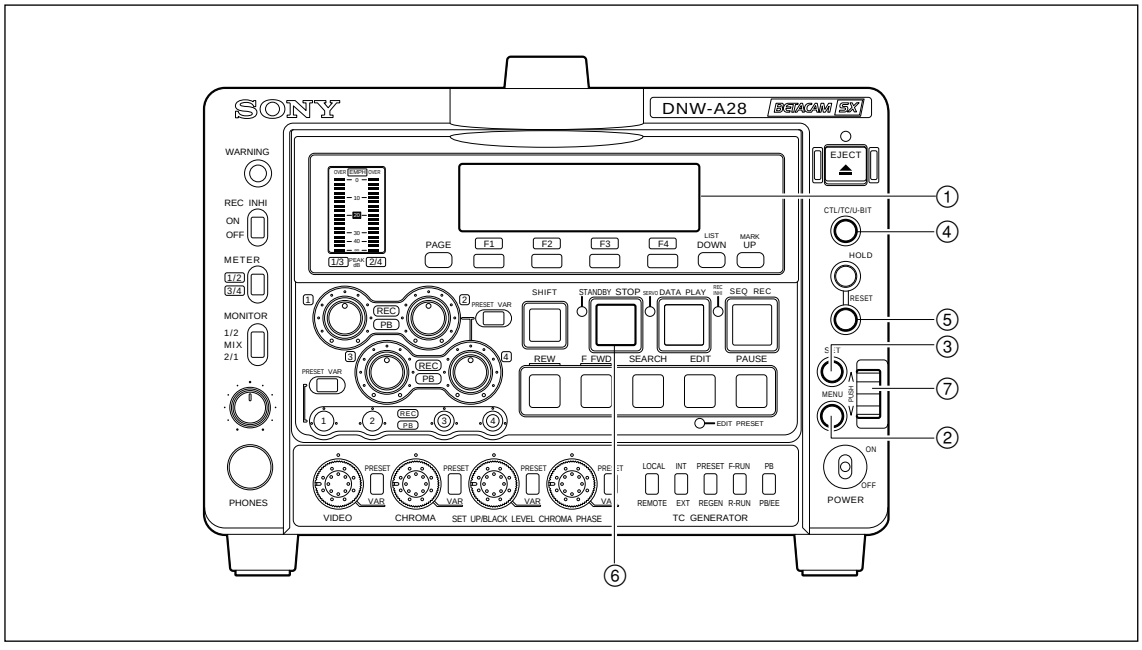
⑦ JOG dial
Turn the JOG dial to specify the menu (mode) or selection item. A “*” mark moves on the video monitor. In a FL display panel, the display is replaced and the specified item blinks. (“JOG DIAL” is displayed on the video monitor.)
The data value or setting can be changed by pushing then turning the JOG dial.

ⓐ S200/SY-259B board: Maintenance mode start switch (MAINTE MODE START)
Push this switch to activate the maintenance mode.

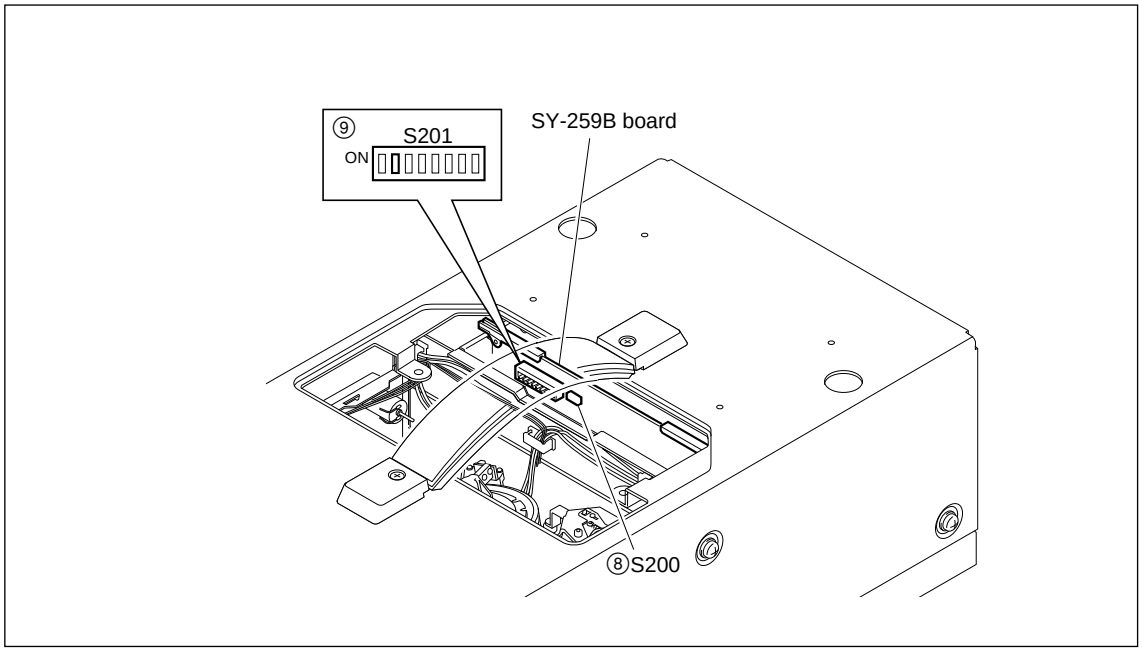
ⓑ S201-2/SY-259B board: Maintenance mode access permission switch (MAINTE MODE Access)
Set this switch to ON in advance when activating the maintenance mode by the button operation on the control panel.

Note

When operating the switches on the SY-259B board, loosen the lid screws using a coin and remove the sub-panel (TOP). Change the setting of DIP switch S201 after turning off the power.



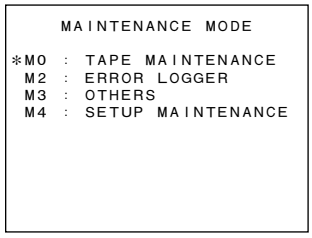
Front Panel



Location of Switches on SY-259B Board

Activating the Maintenance Mode

(1) Push the ⑧ S200 switch (on the SY-259B board).
(2) The mode screen in the maintenance mode is superimposed on the video monitor.
In a ① FL display panel, “M0-TAPE MAINTEN” is displayed.



Video monitor

FL display panel

Activating the Maintenance Mode from Front Panel

The maintenance mode can be activated by the operation below when the S201-2 switch (on the SY-259B board) is set to ON (upper).

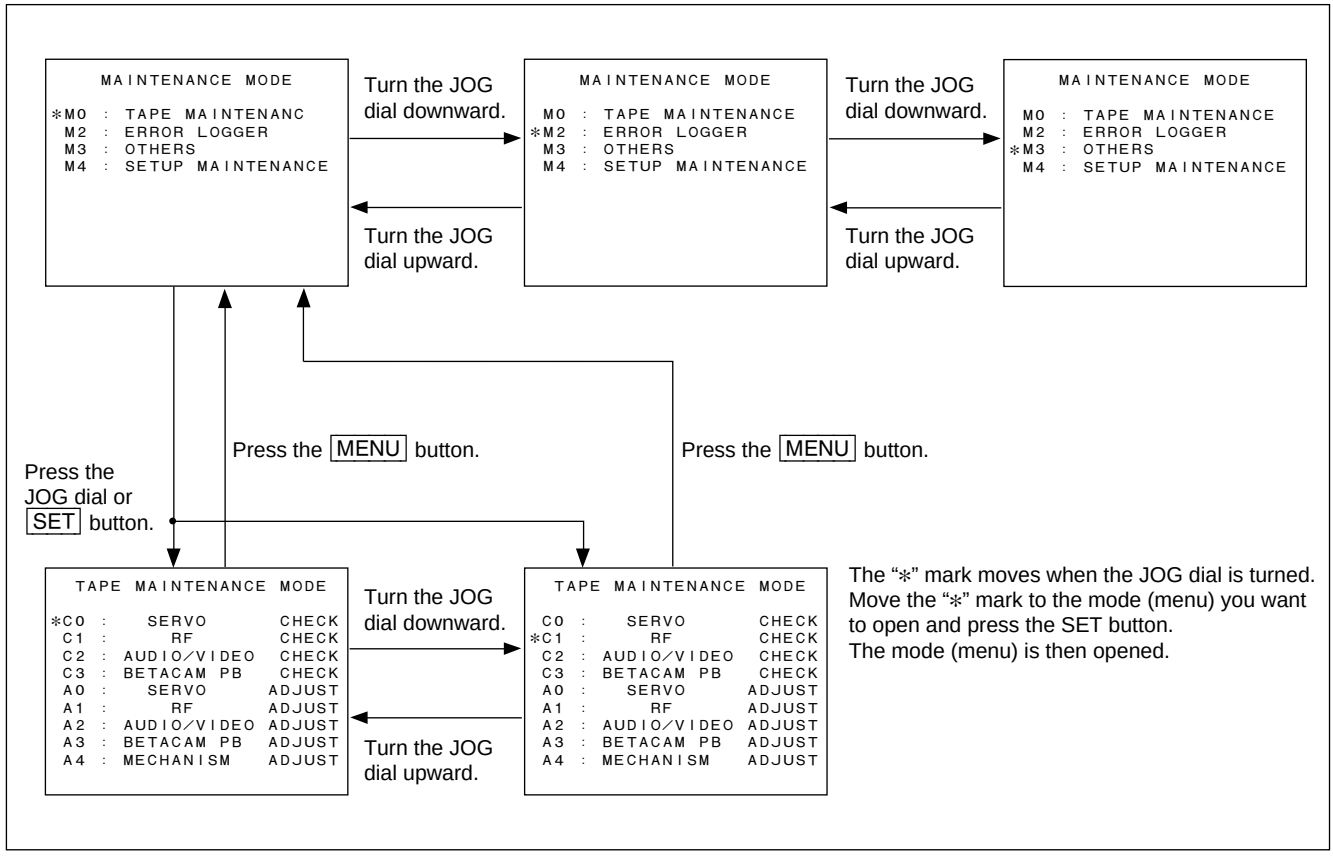
(1) Push the ② MENU button once.
(Execute the setup menu mode from the operation mode.)
(2) Push the ③ SET button while pressing the ④ CTL/TC/U-BIT button.
(Execute the maintenance mode from the setup menu mode.)
(3) The mode screen in the maintenance mode is displayed on the video monitor.

Terminating the Maintenance Mode

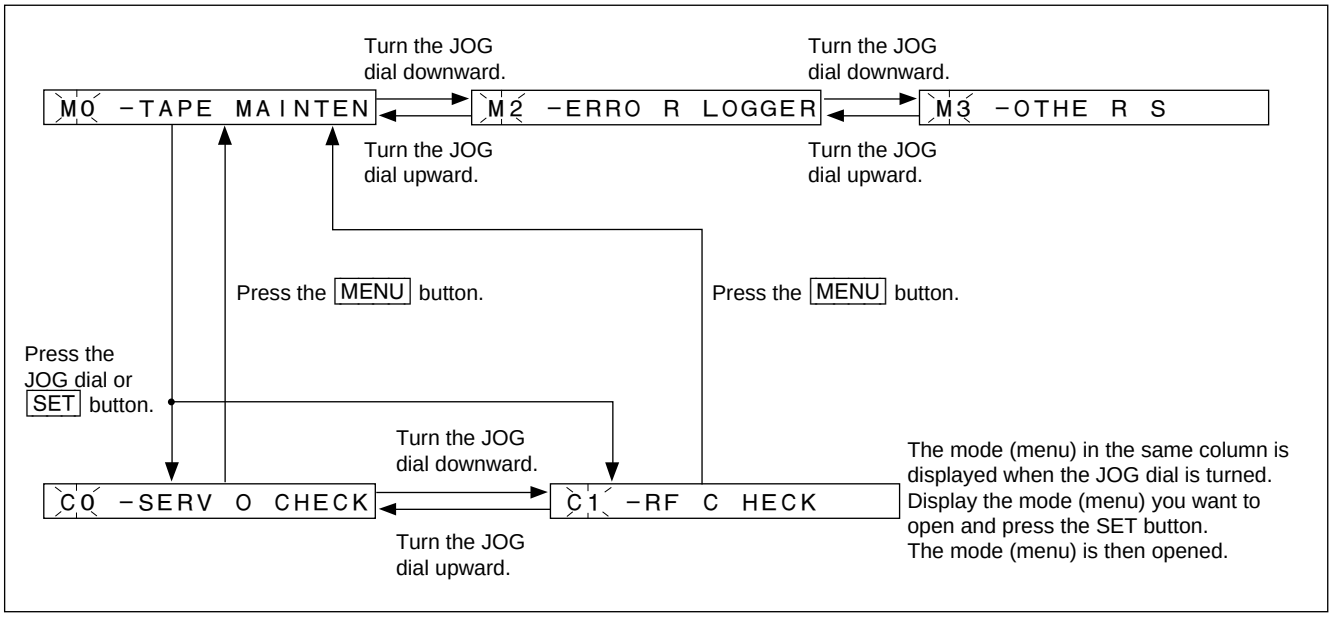
(1) Push the ② MENU button several times to display the mode screen on the video monitor.
The selected mode No. and title are displayed in a FL display panel.
(2) Push the ② MENU button again to terminate the maintenance mode.

Specifying the Menu (Mode) and Item

How to specify the menu (mode) and item using the JOG dial is described below with the mode selection given as an example.


MAINTENANCE MODE
*M0 : TAPE MAINTENANC
M2 : ERROR LOGGER
M3 : OTHERS
M4 : SETUP MAINTENANCE
Turn the JOG dial downward.
Turn the JOG dial upward.
MAINTENANCE MODE
M0 : TAPE MAINTENANCE
*M2 : ERROR LOGGER
M3 : OTHERS
M4 : SETUP MAINTENANCE
Turn the JOG dial downward.
Turn the JOG dial upward.
MAINTENANCE MODE
M0 : TAPE MAINTENANCE
M2 : ERROR LOGGER
*M3 : OTHERS
M4 : SETUP MAINTENANCE
Press the MENU button.
Press the MENU button.
Press the JOG dial or SET button.
TAPE MAINTENANCE MODE
*C0 : SERVO CHECK
C1 : RF CHECK
C2 : AUDIO/VIDEO CHECK
C3 : BETACAM PB CHECK
A0 : SERVO ADJUST
A1 : RF ADJUST
A2 : AUDIO/VIDEO ADJUST
A3 : BETACAM PB ADJUST
A4 : MECHANISM ADJUST
Turn the JOG dial downward.
Turn the JOG dial upward.
TAPE MAINTENANCE MODE
C0 : SERVO CHECK
*C1 : RF CHECK
C2 : AUDIO/VIDEO CHECK
C3 : BETACAM PB CHECK
A0 : SERVO ADJUST
A1 : RF ADJUST
A2 : AUDIO/VIDEO ADJUST
A3 : BETACAM PB ADJUST
A4 : MECHANISM ADJUST
The “*” mark moves when the JOG dial is turned.
Move the “*” mark to the mode (menu) you want to open and press the SET button.
The mode (menu) is then opened.

Video Monitor Screen


Turn the JOG dial downward.
Turn the JOG dial downward.
M0 -TAPE MAINTEN
M2 -ERRO R LOGGER
M3 -OTHE R S
Turn the JOG dial upward.
Turn the JOG dial upward.
Press the MENU button.
Press the MENU button.
Press the JOG dial or SET button.
Turn the JOG dial downward.
C0 -SERV O CHECK
C1 -RF C HECK
Turn the JOG dial upward.
The mode (menu) in the same column is displayed when the JOG dial is turned.
Display the mode (menu) you want to open and press the SET button.
The mode (menu) is then opened.

FL Display Panel

3-2. TAPE Maintenance Mode (M0)

3-2-1. Overviews

The TAPE maintenance mode is used for the maintenance and check of a VTR.
This unit has the nine submodes below.

```
  TAPE MAINTENANCE MODE

*C0 :    SERVO       CHECK
 C1 :      RF        CHECK
 C2 : AUDIO/VIDEO   CHECK
 C3 : BETACAM PB    CHECK
 A0 :    SERVO      ADJUST
 A1 :      RF       ADJUST
 A2 : AUDIO/VIDEO  ADJUST
 A3 : BETACAM PB   ADJUST
 A4 : MECHANISM    ADJUST
```

TAPE Maintenance Mode

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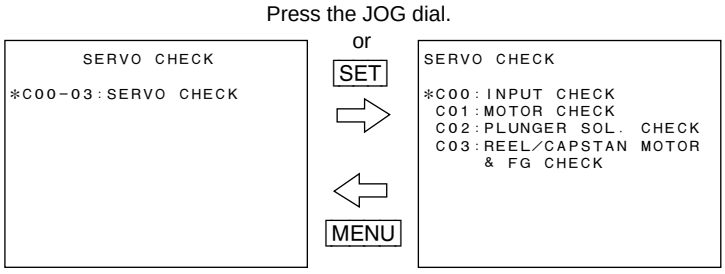
C0: SERVO CHECK

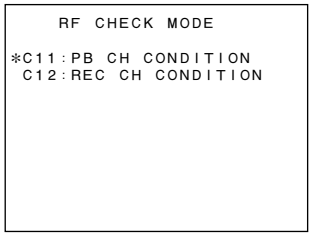
This submode is used to check the servo system of a VTR.
For more details, refer to Section 3-2-2.



Title		Page	Description
C00 :	INPUT CHECK	—	Check menu of sensors (not including a part of sensors)
	C000 : CASSETTE SW	3-13	Checks the cassette tab and REC inhibit sensors.
	C001 : CASSETTE COMP. LOCK SW	3-14	Checks the cassette-in and cassette size sensors.
	C002 : TOP/END SENSOR	3-15	Checks the tape top and tape end sensors.
	C003 : DEW SENSOR	3-16	Checks the dew condensation sensors.
C01 :	MOTOR CHECK	—	Check menu of motors (except a fan motor) and partial sensors
	C010 : S REEL MOTOR	3-17	Checks the S reel motor.
	C011 : FUNCTION CAM MOTOR	3-18	Checks the threading motor and threading/unthreading end sensors.
	C012 : CAPSTAN MOTOR	3-20	Automatically checks the capstan motor.
	C013 : DRUM MOTOR	3-21	Automatically checks the drum motor.
C02 :	PLUNGER SOL. CHECK	—	Check menu of solenoids
	C020 : S REEL BRAKE	3-22	Checks the S reel brake solenoid.
C03 :	REEL/CAPSTAN MOTOR & FG CHECK	3-23	Continuous check menu of reel and capstan motors

C1 : RF CHECK

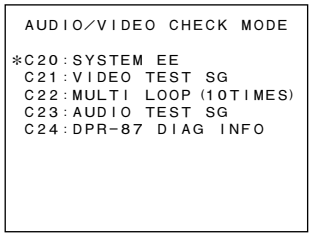
This submode is used to check the RF system.
For more details, refer to Section 3-2-3.



Title	Page	Description
C11 : PB CH CONDITION	3-25	Checks the error condition for each PB head (A1, A2, A3, B1, B2, B3) on a drum in the PB mode.
C12 : PEC CH CONDITION	3-30	Checks the error condition for each PB head (A1, A2, A3, B1, B2, B3) on a drum in the REC mode.

C2 : AUDIO/VIDEO CHECK

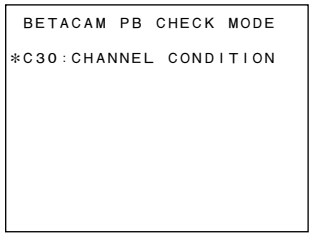
This submode is used to check the audio and video systems.
For more details, refer to Section 3-2-4.



Title	Page	Description
C20 : SYSTEM EE	3-35	Sets the system E-E function in the maintenance mode.
C21 : VIDEO TEST SG	3-36	Sets the video test signal generator incorporated into this unit.
C22 : MULTI LOOP	3-37	Sets the multi-loop function in the maintenance mode.
C23 : AUDIO TEST SG	3-38	Sets the audio test signal generator incorporated into this unit.
C24 : DPR-87 DIAG INFO	3-39	Displays the result of self diagnostic in DPR-87 board.

C3 : BETACAM PB CHECK

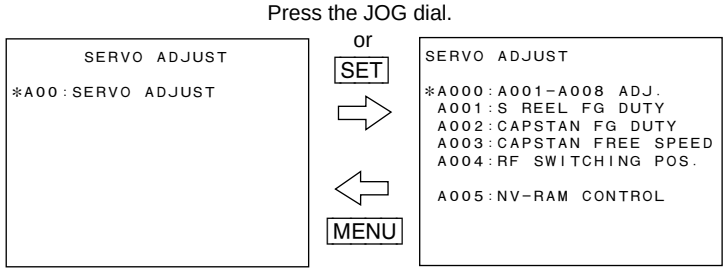
This submode is used to check the PB system based on a Betacam/Betacam SP format.
For more details, refer to Section 3-2-5.



Title	Page	Description
C30 : CHANNEL CONDITION	3-43	Checks the RF level condition for each video channel (Y and C) to be played back.

A0 : SERVO ADJUST

This submode is used to adjust the servo system.
For more details, refer to Section 3-2-6.



Title	Page	Description
A000 : A001-A003 ADJ.	3-46	Continuously executes the automatic adjustment menus (A001 to A003).
A001 : S REEL FG DUTY	3-47	Automatically adjusts the duty ratio of an S reel FG.
A002 : CAPSTAN FG DUTY	3-47	Automatically adjusts the duty ratio of a capstan FG.
A003 : CAPSTAN FRICTION	3-47	Automatically adjusts the capstan friction.
A004 : CAPSTAN FREE SPEED	3-48	Automatically adjusts the capstan free speed.
A005 : RF SWITCHING POS.	3-49	Automatically adjusts the RF switching position.
A006 : NV-RAM CONTROL	3-51	Saves the adjustment data in a servo system.

A1 : RF ADJUST

This submode is used to adjust the RF system.
For more details, refer to Section 3-2-7.

```
    RF ADJUST MODE

*A11:EQUALIZER
 A12:REC CURRENT
 A13:PLAY PLL
 A14:FWD PLL
 A15:REV PLL
 A16:A/D GAIN
 A17:A11-A16 ALL ADJUST
 A1F:NV-RAM CONTROL
```

Title	Page	Description
A11 : EQUALIZER	3-52	Automatically adjusts the PB head playing back level and PB equalizer (for A1, A2, A3, B1, B2, and B3 channels).
A12 : REC CURRENT	3-52	Automatically adjusts the recording current.
A13 : PLAY PLL	3-52	Automatically adjusts the PB PLL circuit (in the PLAY mode).
A14 : FWD PLL	3-52	Automatically adjusts the PB PLL circuit (in the FORWARD mode).
A15 : REV PLL	3-52	Automatically adjusts the PB PLL circuit (in the REVERSE mode).
A16 : A/D GAIN	3-52	Automatically adjusts the gain when a PB RF signal is converted from analog to digital.
A17 : A11-A16 ALL ADJUST	3-58	Continuously executes the above automatic adjustment menus A11 to A16.
A1F : NV-RAM CONTROL	3-61	Saves the adjustment data in an RF system.

A2 : AUDIO/VIDEO ADJUST

This submode is used to adjust the audio and video systems.
For more details, refer to Section 3-2-8.

```
AUDIO/VIDEO ADJUST MODE

*A20:VPR/TG VR
 A23:SDI VR
 A24:INPUT CF DETECT
 A25:DEC VR
 A26:DEC VR (LOOP)
 A27:VIDEO METER
 A2F:NV-RAM CONTROL
```

Title	Page	Description
A20 : VPR/TG VR	3-63	Adjusts the reference signal system and analog video output system on the VPR-34 and TG-191/191P boards.
A23 : SDI VR	3-63	Adjusts the SDI input/output interface.
A231 : SDI ENC VCO	3-63	Automatically adjusts the SDI output interface.
A232 : SDI DEC VCO	3-63	Automatically adjusts the SDI input interface.
A24 : INPUT CF DETECT	3-66	Automatically adjusts the color frame detection timing of a composite video input.
A25 : DEC VR	3-68	Adjusts the composite video input system.
A26 : DEC VR (LOOP)	3-68	Adjusts the composite video input (in the multi-loop state).
A27 : VIDEO METER	3-68	Calibration of video meter on the FL display panel.
A2F : NV-RAM CONTROL	3-70	Saves the adjustment data in audio and video systems.

A3 : BETACAM PB ADJUST

This submode is used to adjust the PB system based on a Betacam/Betacam SP format.
For more details, refer to Section 3-2-9.

```
 BETACAM PB ADJUST MODE

*A30:EQ VR
 A32:DM VR 1
 A33:DM VR 2
 A34:DM VR 3
 A35:DM VR 4
 A36:DM VR 5
 A37:TBC VR
 A3F:NV-RAM CONTROL
```

Title	Page	Description
A30 : EQ VR	3-72	Adjusts the gain of an analog Betacam PB RF amplifier (EQ-72 board).
A32 : DM VR 1	3-72	Adjusts the frequency characteristics of a primary cosine equalizer (DM-114/114P board).
A33 : DM VR 2	3-72	Adjusts the frequency characteristics of a secondary cosine equalizer (main) (DM-114/114P board).
A34 : DM VR 3	3-73	Adjusts the frequency characteristics of a secondary cosine equalizer (sub) (DM-114/114P board).
A35 : DM VR 4	3-73	Adjusts the guard band width and sets the DC offset level of an over-modulation compensation circuit.
A36 : DM VR 5	3-73	Adjusts the threshold level of a dropout and sets the threshold level of an RF envelope.
A37 : TBC VR	3-73	Sets the read clock timing on the DM-114/114P board and the data of a PB VISC phase detection circuit.
A3F : NV-RAM CONTROL	3-74	Saves the adjustment data in an analog Betacam PB system.

A4 : MECHANISM ADJUST

This submode is used to adjust the mechanism part.
For more details, refer to Section 3-2-10.

```
    MECHANISM ADJUST
*A40:PATH MODE SEL
```

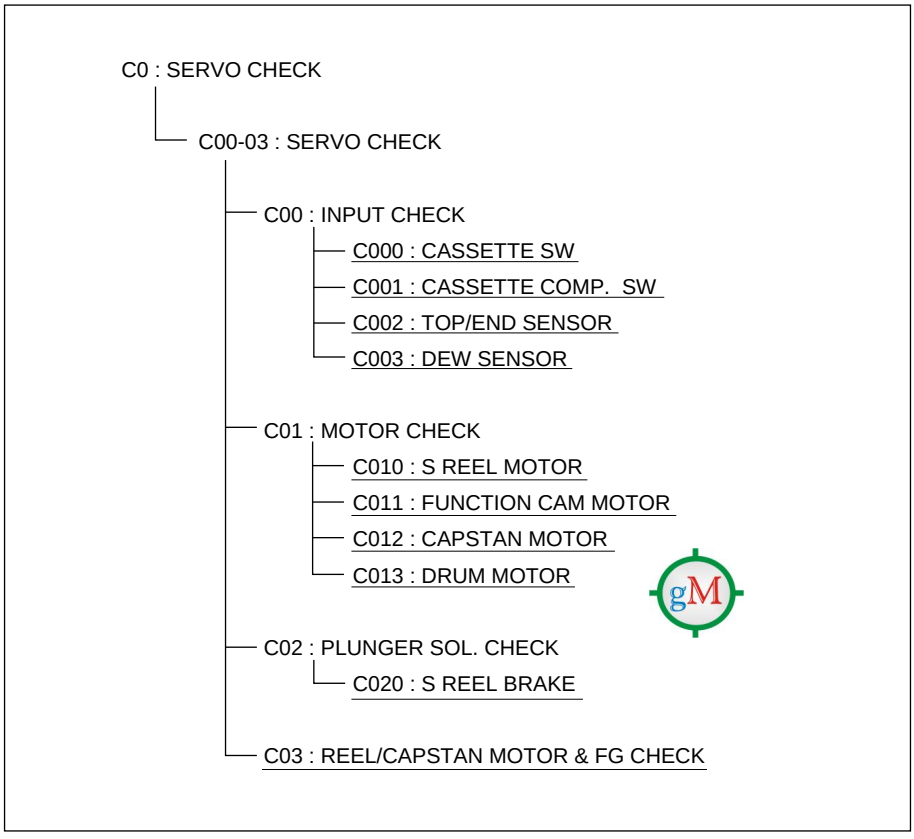
Title	Page	Description
A40 : PATH MODE SEL	3-75	Sets the tape PB mode (Used for tape transport adjustment).

3-2-2. SERVO CHECK Mode (C0)

The C0: SERVO CHECK mode is used to check the servo system of a VTR.
The underlined menus and submenus in the menu tree below are described next.

Note

In the servo check mode, only the menu number is displayed in a FL display panel.
(C00-03 is displayed as “C00”.)


C0 : SERVO CHECK
C00-03 : SERVO CHECK
C00 : INPUT CHECK
C000 : CASSETTE SW
C001 : CASSETTE COMP. SW
C002 : TOP/END SENSOR
C003 : DEW SENSOR
C01 : MOTOR CHECK
C010 : S REEL MOTOR
C011 : FUNCTION CAM MOTOR
C012 : CAPSTAN MOTOR
C013 : DRUM MOTOR
C02 : PLUNGER SOL. CHECK
C020 : S REEL BRAKE
C03 : REEL/CAPSTAN MOTOR & FG CHECK

Menu Tree of Servo System Check Mode

Note

A cassette tape is automatically ejected if it has been inserted into this unit when the C00-03 : SERVO CHECK screen is shifted to the lower-level menu.

C000 : CASSETTE SW

This submenu checks the functions of cassette tab sensors and REC inhibit sensors (switches).

```
 INPUT CHECK

C000:CASSETTE SW
 1:REEL HUB   2:METAL/OX
 3:THICKNESS  4:SPARE
 5:SPARE      6:DGTL/ANLG
 7:S REC INH

                 7  1 3
 SW 7654321        425
    0000000         6
```

(1) Press each sensor (switch) and hold it with a finger.
- Check to see that “0” below the corresponding switch number changes to “1”.

(2) Release the sensor (switch).
- Check to see that “1” below the corresponding switch number returns to “0”.

(ex.: When pushing the switch ⑦)

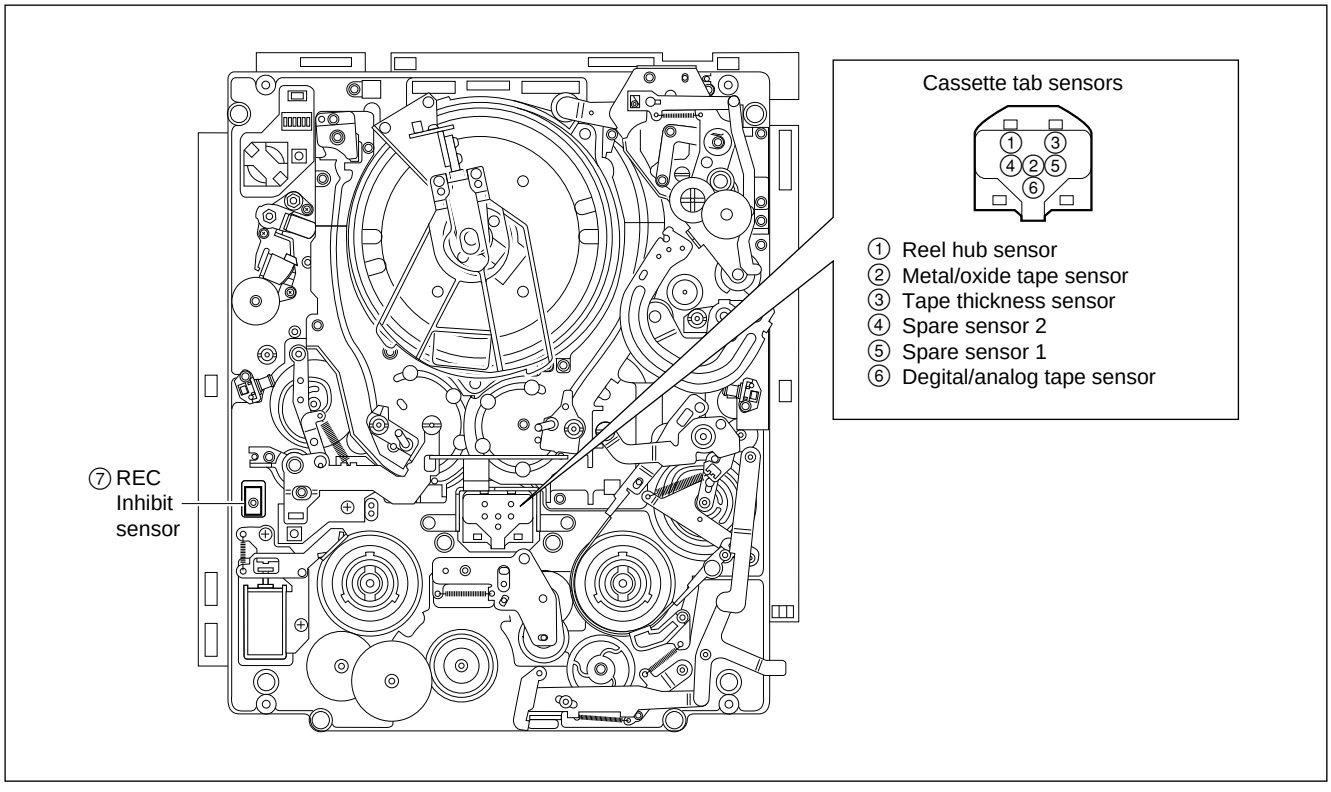
```
 INPUT CHECK

C000:CASSETTE SW
 1:REEL HUB   2:METAL/OX
 3:THICKNESS  4:SPARE
 5:SPARE      6:DGTL/ANLG
 7:S REC INH

                 7  1 3
 SW 7654321        425
    1000000         6
```

(3) To finish the check, push the MENU button.

In case of NG

When cassette tab sensors (① to ⑥) are NG
- Check the corresponding sensor (S400 to S405) on the SV-194A board.
- Check the sensor input port of CPU (IC401 on the SV-194A board).

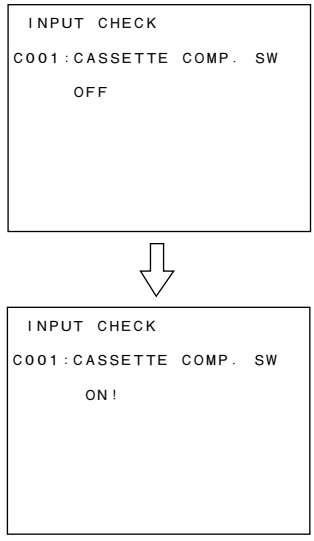
When REC inhibit sensor (⑦) is NG
- Check the sensor (S406) on the SV-194A board.
- Check the sensor input port of CPU (IC401 on the SV-194A board).



Locations of Sensors (Switches)

C001 : CASSETTE COMP. SW

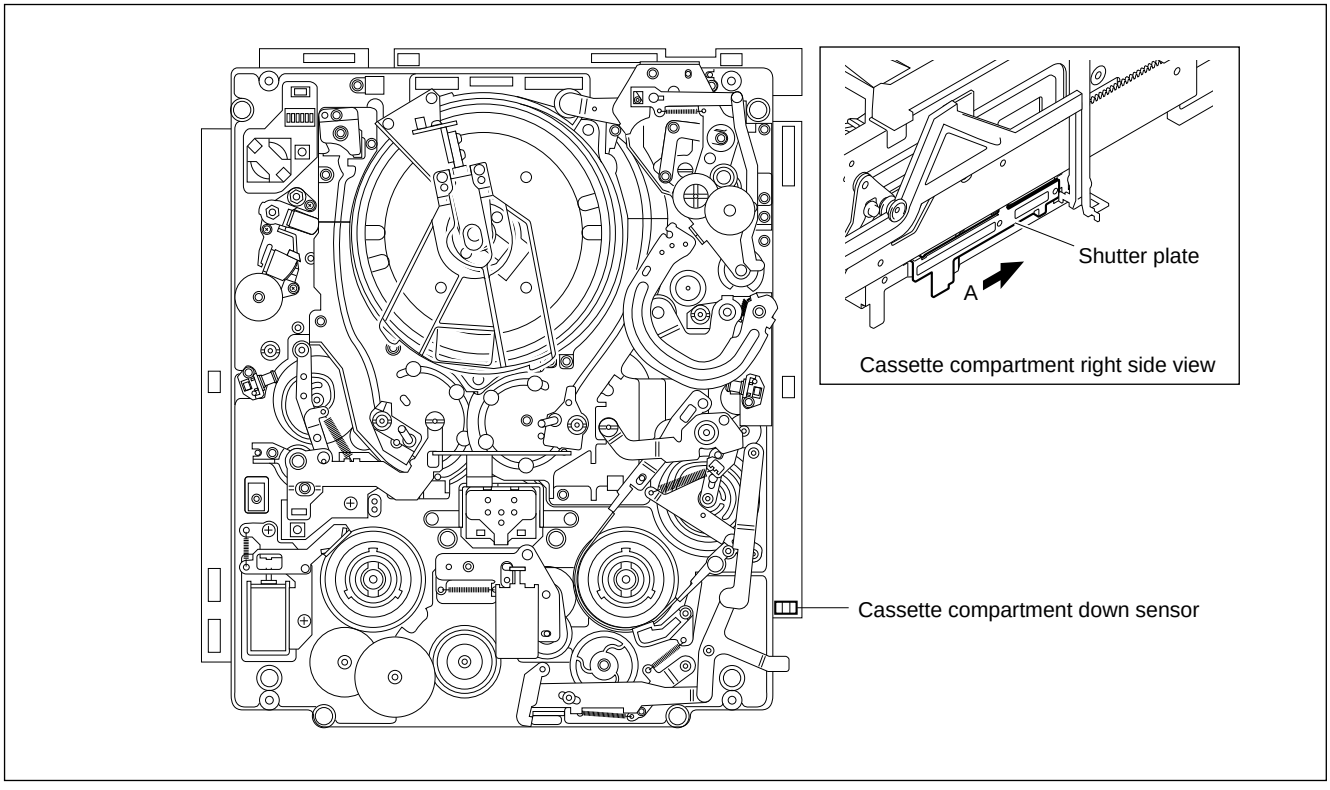
This submenu checks the function of the cassette compartment down sensor.



(1) Move the slide panel upward.
(2) Check to see that the message on the video monitor changes from “OFF” to “ON!” by moving the shutter plate at the right side of the cassette compartment in the arrow direction.
(3) To finish the check, push the MENU button.

In case of NG

- Check the cassette compartment down sensor on the SV-194A board.
- Check the sensor input port of CPU (IC304 on the SV-194A board).



Cassette compartment down sensor

C002 : TOP/END SENSOR

This submenu checks the functions of a tape top sensor and tape end sensor.

```
 INPUT CHECK

C002:TOP/END SENSOR

   END            TOP
 SENSOR         SENSOR

   OFF            OFF
```

(1) Close a metallic screwdriver to each sensor.
- Check to see that the characters below the corresponding sensor change from "OFF" to "ON!".

CAUTION

Pay careful attention to keep the screwdriver from contact with each sensor.

(2) Distance the screwdriver from each sensor.
- Check to see that the characters below the corresponding sensor return from "ON!" to "OFF".

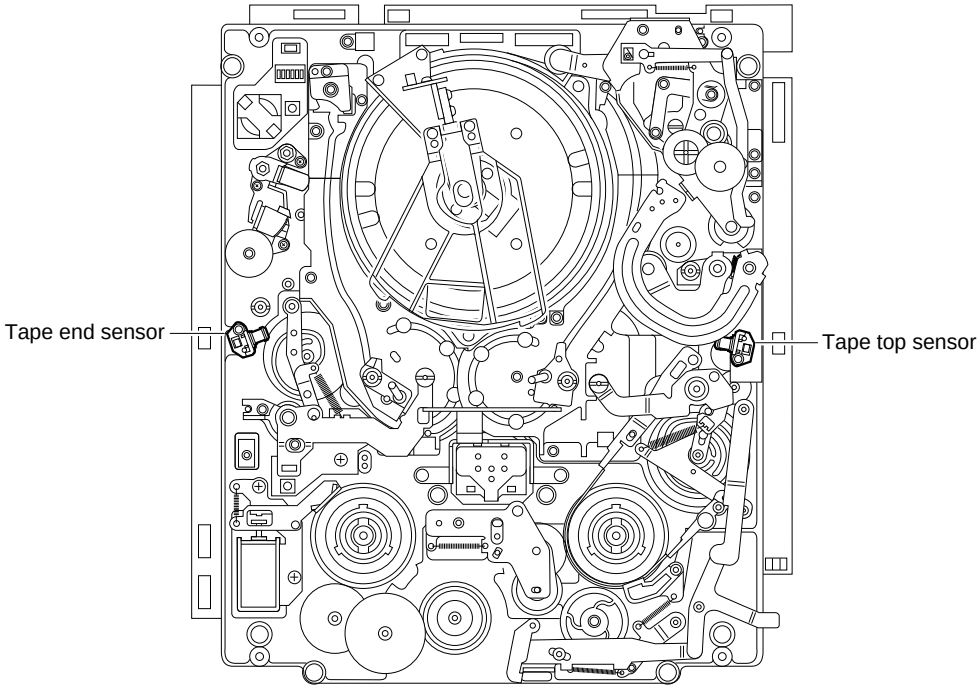
(ex.)

```
 INPUT CHECK

C002:TOP/END SENSOR

   END            TOP
 SENSOR         SENSOR

   OFF            ON!
```

(3) To finish the check, push the MENU button.

In case of NG

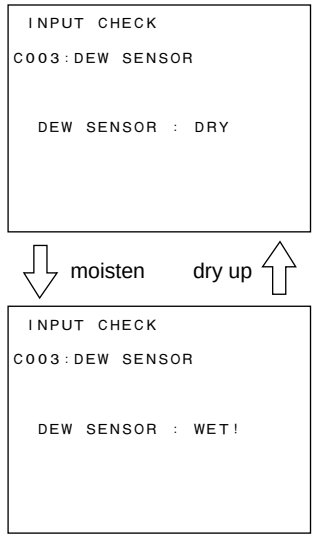
- Check each sensor itself.
- Check the oscillator and detection circuit (IC405 on the SV-194A board) for sensors.
- Check the sensor input port of CPU (IC116 on the SV-194A board).



Locations of Tape Top and Tape End Sensors

C003 : DEW SENSOR

This submenu checks the function of a dew condensation sensor.



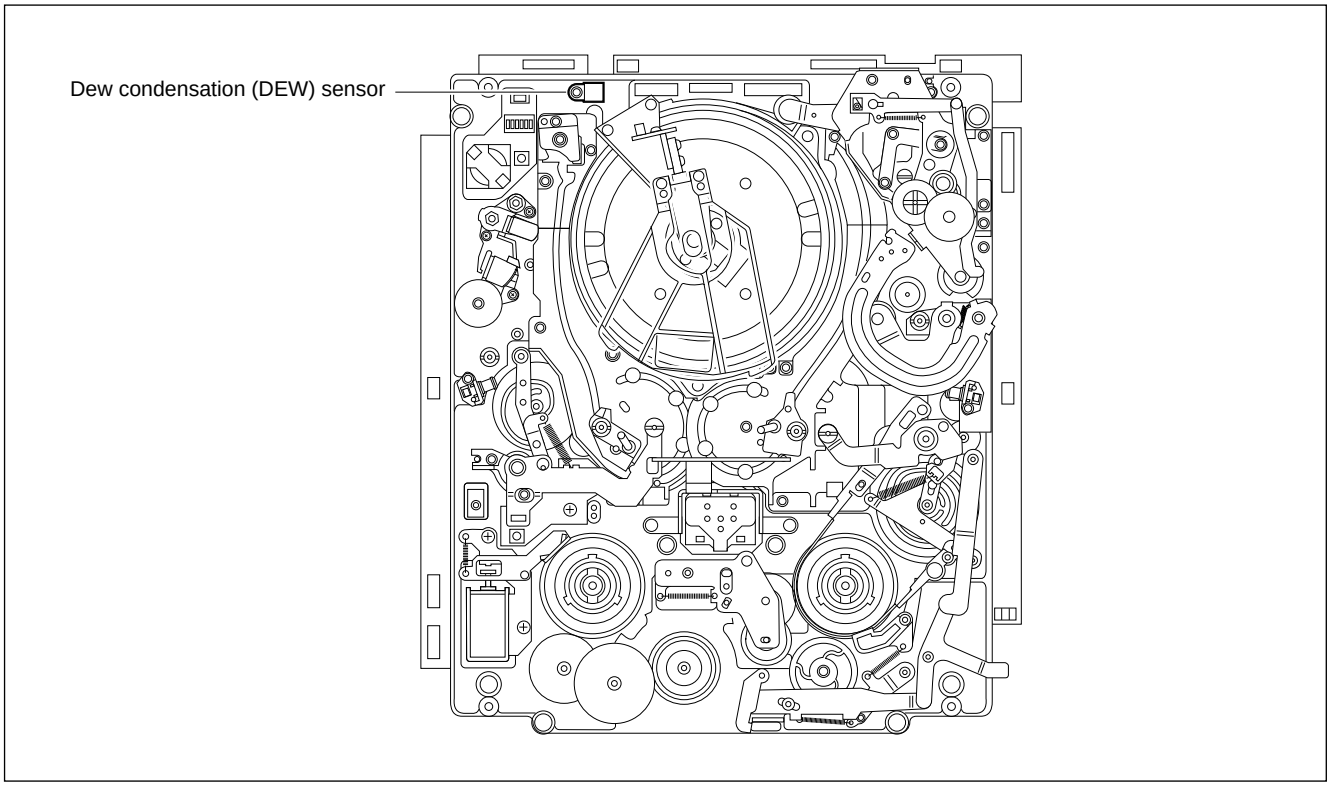
(1) Touch the sensor slightly with the cotton swab moistened with water.
- Check to see that the “DRY” characters change to “WET!”.

(2) Wipe the sensor with a dry cotton swab to eliminate the moisture or evaporate moisture completely using a blower.
- Check to see that the “WET!” characters return to “DRY”.

(3) To finish the check, push the MENU button.

In case of NG

- Check the sensor itself.
- Check the detection circuit (on the SV-194A board).
- Check the sensor input port of CPU (IC401 on the SV-194A board).



Location of Dew Condensation Sensor

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C010 : S REEL MOTOR

This sub menu checks the function of an S reel motor.

```
 MOTOR CHECK
C010:S REEL MOTOR


 TURN JOG DIAL
      IN JOG MODE
```

(1) Turn the JOG dial downward or upward.
Check to see that the reel table rotates in the specified direction at a fixed speed (about one turn per second) after the reel brake is released.

Rotation direction of JOG dial	Rotation direction of reel table
Downward (⇩)	Clockwise (↻)
Upward (⇧)	Counterclockwise (↺)

(2) Stop the rotation of the JOG dial and check that the reel table stops and that the reel brake operates.

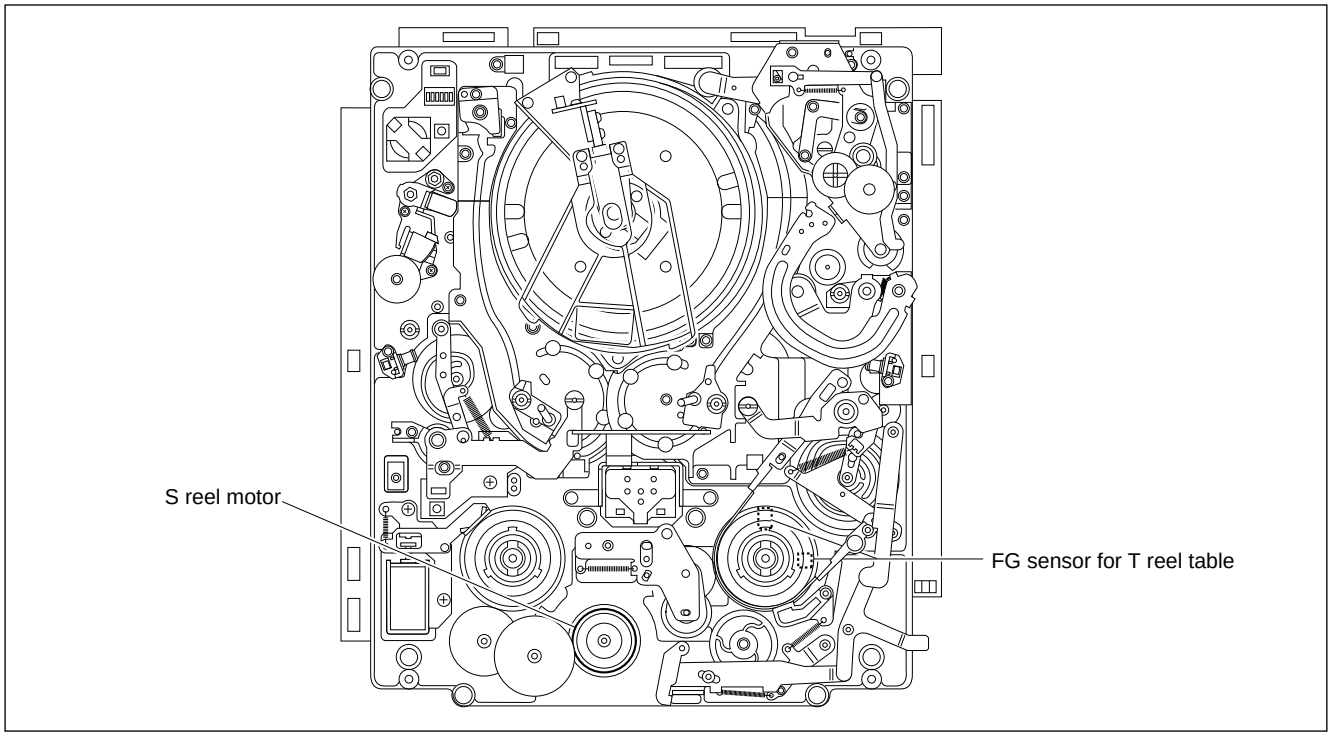
(3) To finish the check, push the MENU button.

In case of NG

When the reel table operation is defective
- Check the S reel motor drive circuit (on the SV-194A board).
- Check the S reel motor.

When the reel table is not constant at a rotation speed
- Adjust the duty ratio of an S reel FG. (A001)
- Check the FG output from a T reel table FG sensor (on the SV-194A board).
- Check the FG output from a S reel motor.
- Check the reel FG shaping circuit (on the SV-194A board).

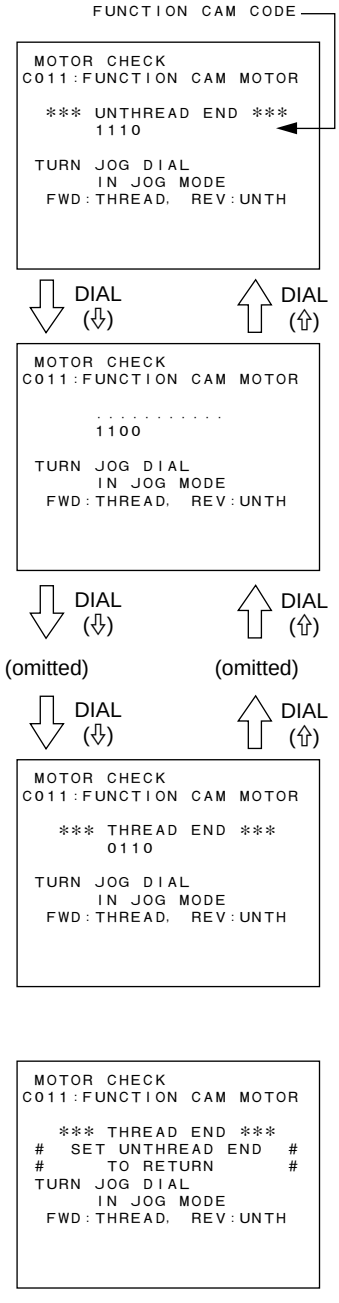
When the brake solenoid operation is defective
- Check the S brake solenoid. (C021)



Locations of Reel Table FG Sensors

C011 : FUNCTION CAM MOTOR

This sub menu checks the functions of a function cam.



(1) Slowly turn the JOG dial downward.
- Check to see that the threading motor rotates and that the threading link moves unthreading direction and stops in the threading end state.
- Check to see that the display on the video monitor changes as described below. (Check that the function cam code shifts according to the transition table on the next page.)

UNTHREAD END ⇨ ..... ⇨ (omitted) ⇨ THREAD END
1100 1100 0110 ← Function cam code

Notes
- The threading motor also stops if the rotation of the JOG dial stops.
- If a code “0111 : THREAD END OVER” is displayed, be sure to finish the operation after restoring the code to “0110 : THREAD END” with JOG dial.

(2) Slowly Turn the JOG dial upward.
- Check to see that the threading motor rotates and that the threading link moves threading direction and stops in the unthreading end state.
- Check to see that the display on the video monitor changes as described below. (Check that the function cam code shifts according to the transition table on the next page.)

THREAD END ⇨ ..... ⇨ (omitted) ⇨ UNTHREAD END
0110 0100 1110

Notes
- The function cam also stops if the rotation of the JOG dial stops.
- If a code “1111 : UNTHREAD END OVER” is displayed, be sure to finish the operation after restoring the code to “0110 : UNTHREAD END” with JOG dial.

(3) To terminate the check, return to the unthreading end state (code : 1110), and then push the MENU button.

Note
Message “SET UNTHREAD END TO RETURN” is displayed if the unit does not put into the unthreading end state (code : 1110) when pressing the MENU button.

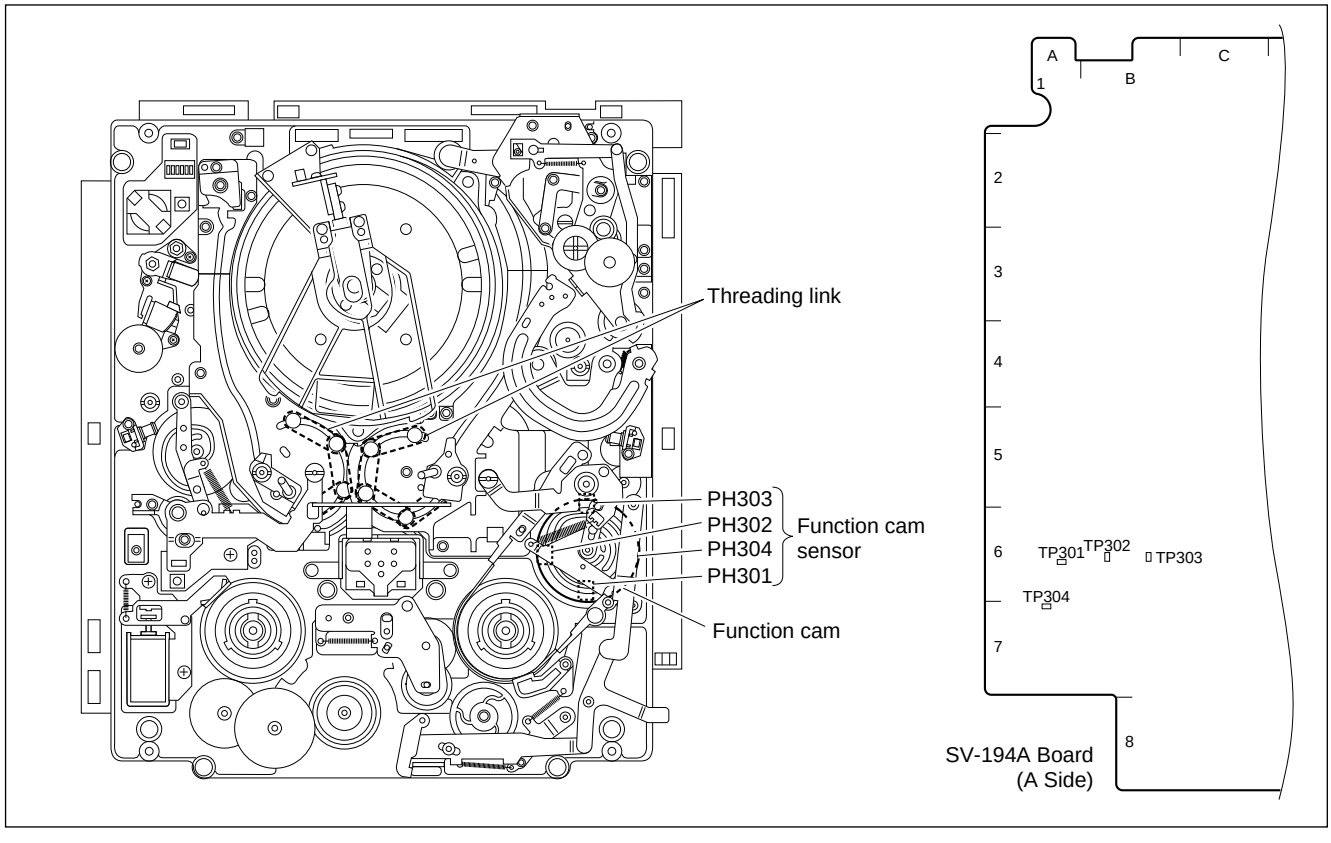
In case of NG
- Check the mechanical abnormality.
- Check the function cam sensor (on the SV-194A board).
- Check the function cam sensor circuit (on the SV-194A board).
- Check the function cam motor drive circuit (on the SV-194A board).
- Check the function cam motor.

Code transition of the function cam

State of sensors (on the SV-194A board)				Condition of this unit
PH304 (TP304)	PH303 (TP303)	PH302 (TP302)	PH301 (TP301)	
1	1	1	1	UNTHREAD END OVER
1	1	1	0	UNTHREAD END
1	1	0	0	
1	1	0	1	
1	0	0	1	
1	0	0	0	
1	0	1	0	
1	0	1	1	
0	0	1	1	
0	0	1	0	
0	0	0	0	
0	0	0	1	
0	1	0	1	
0	1	0	0	
0	1	1	0	THREAD END
0	1	1	1	THREAD END OVER

THEADING

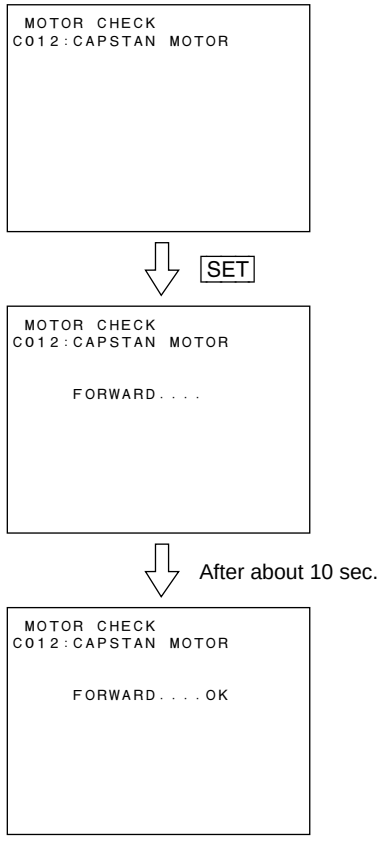
UNTHREADING



Locations of Threading End and Unthreading End Sensors

C012 : CAPSTAN MOTOR

This sub menu checks the function of a capstan motor.



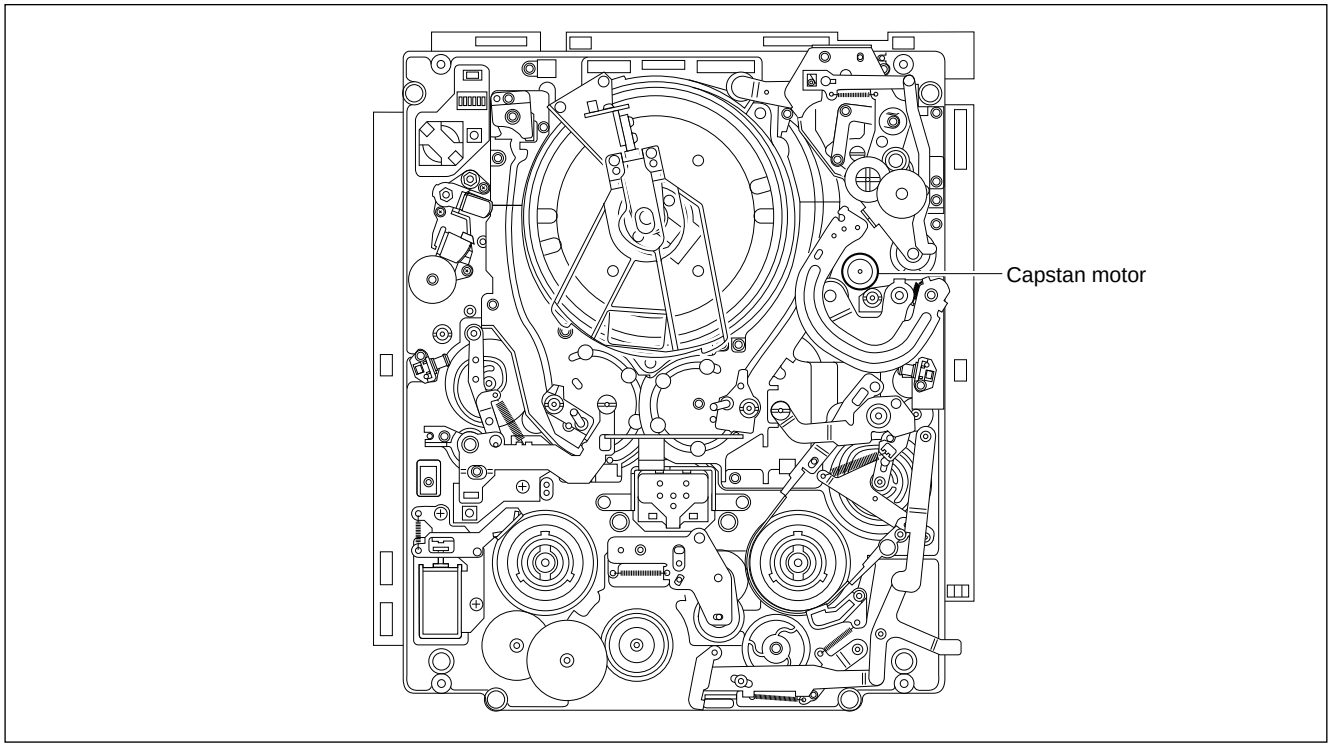
(1) Push the JOG dial or SET button.
- Check to see that the capstan shaft rotates in the forward (↻) direction.
- Check to see that message “FORWARD....OK” is displayed on the video monitor and that the capstan shaft stops.

(2) Push the JOG dial or SET button again.
- Check to see that the capstan shaft rotates in the reverse (↺) direction.
- Check to see that message “REVERSE....OK” is displayed on the video monitor and that the capstan shaft stops.

(3) To finish the check, push the MENU button.

In case of NG

- Check the mechanical abnormality.
- Check the capstan motor drive circuit (on the SV-194A board).
- Check the FG output from a capstan motor.
- Check the capstan FG shaping circuit (on the SV-194A board).
- Check each circuit that processes the capstan FG on the SV-194A board.
- Check the capstan motor.



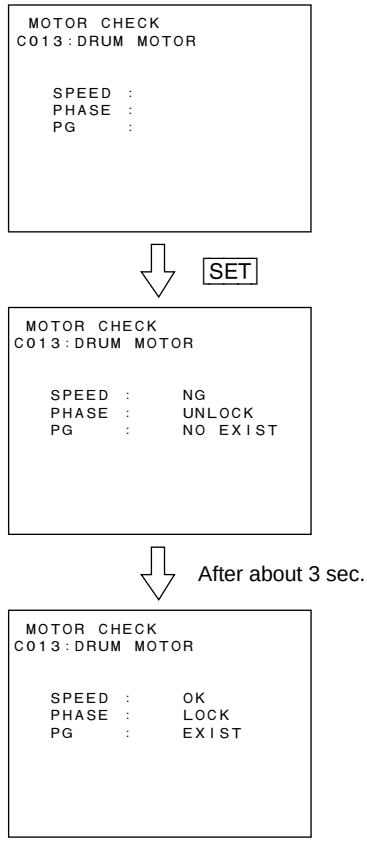
Location of Capstan Shaft

C013 : DRUM MOTOR

This sub menu checks the function of a drum motor.

(1) Push the JOG dial or SET button.
- Check to see that the drum rotates.
- Check to see that the video monitor changes as shown on the right.

(2) To finish the check, push the MENU button.
- Check to see that the drum stops.



In case of NG

- Check the mechanical abnormality.
- Check the drum motor drive circuit (on the SV-194A board).
- Check the FG and PG outputs from a drum motor.
- Check each circuit that processes the drum FG/PG on the SV-194A board.

C020 : S REEL BRAKE

This sub menu checks the function of an S reel brake solenoid.

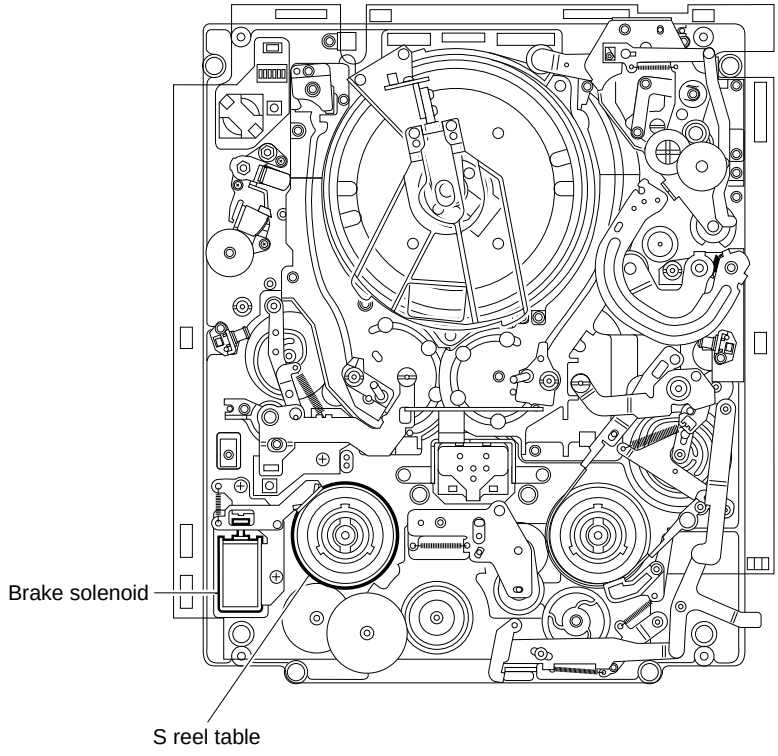
```
 PLUNGER SOLENOID
C020:S REEL BRAKE
```

(1) Push the JOG dial or SET button.
- Check the “click” sound when the reel brake solenoid is activated. (The reel table can be smoothly turned with a hand because the brakes are released.)

(2) Push the MENU button.
- The check menu is terminated.
- Turn the reel table clockwise by fingers, and then check that the brake is applied to the reel table because the reel brake solenoid is deactivated.

In case of NG

- Check the mechanical abnormality.
- Check the drive circuit of the reel brake solenoid (on the SV-194A board).
- Check the reel brake solenoid itself.



Location of Reel Brake Solenoid

C03 : REEL/CAPSTAN MOTOR & FG CHECK

This menu checks the following items automatically and continuously.
- S reel FG duty ratio (C031 : S REEL FG/MOTOR CHECK)
- Capstan FG duty ratio (C033 : CAPSTAN FG/MOTOR CHECK)

(1) Select C03 in the servo check mode and push the JOG dial or SET button to start the check.
- The item name to be checked is displayed on the video monitor, and the menu number (C031 and C032) is displayed in a FL display panel.

(2) Check to see that the message “CHECK COMPLETE” is displayed after completing all the checks.
If the message “# CHECK INCOMPLETE #” is displayed halfway, refer to the follwing NG cases during check.

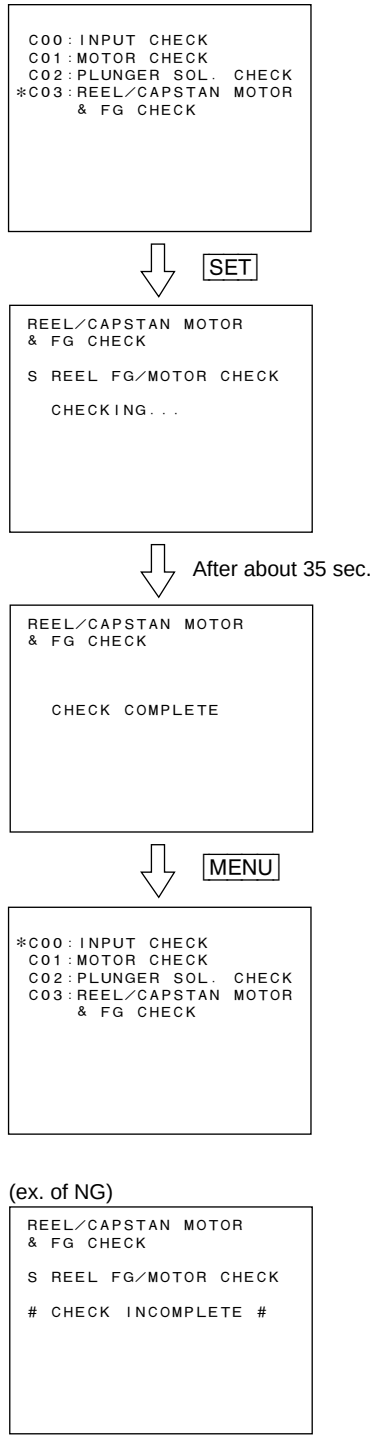
(3) To return to the selection of the servo check mode, push the MENU button.

In the case of NG during (C031) S REEL FG/MOTOR CHECK

Perform the S reel motor check (C010). If no abnormality is found in the motor or its drive circuit, perform the S reel FG duty adjustment (A001).

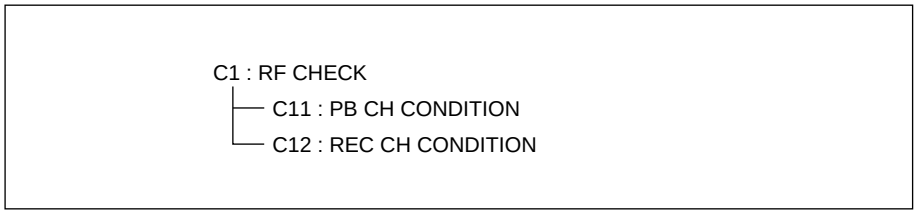
In the case of NG during (C032) CAPSTAN FG/MOTOR CHECK

Perform the capstan motor check (C014). If no abnormality is found in the motor or its drive circuit, perform the capstan FG duty adjustment (A003).



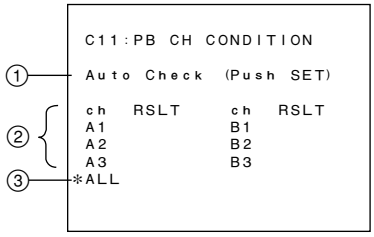
3-2-3. RF CHECK Mode (C1)

The C1 : RF CHECK mode is used to check the PB RF system based on an Betacam SX format.



Menu Tree of RF System Check Mode

C11 : PB CH CONDITION



In this menu, the error condition for each channel is displayed in three steps (GRN, YEL, and RED) when the tape recorded based on a Betacam SX format is played back by tracking.
C11 checks using the PB signal from the PB heads (A1, A2, A3, B1, B2, and B3 channels) in the PB mode.

Notes

- During normal played back operation, the tape is played back by non-tracking. Therefore, the condition for each channel cannot be checked using a CH CONDITION indicator.
- If abnormality exists in the servo system of a VTR, each menu of C1 : RF CHECK does not function properly.

Description of video monitor

① The display in this line changes. Each display and its meaning are described below.

Auto Check (Push SET) :	Push the SET button to start the check.
Insert SR5-1 :	Insert an alignment tape.
Auto Tracking... :	Tracking is in an optimization process.
Auto Checking... :	Check is in progress.
Auto Check Complete :	Check is completed.
Auto Check Failure :	Check failure
Condition NG :	Error condition defect

② Select using a * mark when checking the condition for each channel.
After the check is completed, the condition (GRN, YEL, or RED) is displayed on the right of a channel name. “RED” is displayed even if the check fails.

Note

“RSLT” indicates the result.

③ Select ALL when checking the condition for all channels.
During check, the condition in each channel is displayed for area ②.
After the check for all channels is completed, “GRN” is also displayed on the right of ALL if the condition for all channels is GRN. If there is at least one channel whose condition is YEL or RED, the worst condition is displayed on the right of ALL.

To execute the check

(1) Insert the alignment tape SR5-1 (for a 525/60 system) or SR5-1P (for a 625/50 system).

Notes

- The tape amount on the recorded portion that is played back after a cassette tape is inserted must exceed the check execution time.
  The check execution time for each channel is usually about ten seconds and about 80 seconds in an ALL check.

(2) Turn the JOG dial and move the ∗ mark to the channel to be checked or ALL.
- Usually, select ALL.

(3) Push the SET button.
- The tape is automatically played back in the PLAY mode. The check is then initiated.
- Message “Auto Tracking ...” or “Auto Checking ...” is displayed on the video monitor.
  During ALL check execution, the check result in the channel is displayed every time a one-channel check is completed.
  The FL display panel displays an ordinary time counter.
- To cancel the check, push the MENU button.

Notes

- Message “Insert SR5-1” is displayed on the video monitor when no cassette tape is inserted. The tape is automatically played back in the PLAY mode when a cassette tape is inserted. The check is then initiated.
- If message “Auto Check (Push SET)” is continuously displayed on the video monitor, the non-recorded portion on the tape is judged to be played back from the beginning. Change the playback position on the tape.
- Check cannot be properly performed in modes other than PLAY mode. Leave the check as it is until automatic check is completed. If modes other than PLAY mode are entered, the check cannot be performed any longer or the condition becomes “RED”.

(4) Confirm the check result on the video monitor.
- If no abnormality is found, “GRN” is displayed on the right of the selected channel or ALL.
- Refer to the “For Check Failure” on page 3-29 when message “Auto Check Failure” is displayed on the video monitor.
- Refer to the “For Condition NG” on page 3-28 when message “Condition NG” is displayed on the video monitor or when conditions other than “GRN” are displayed on the right of the checked channel.

Notes

- Refer to the “For Check Failure” on page 3-29 when the check result in all channels is “RED” even if message “Condition NG” is displayed on the video monitor during ALL check execution.
- “GRN”, “YEL”, or “RED” is displayed in a FL display panel. In only the FL display panel, it cannot be confirmed whether the condition is NG or check failure when it is “RED”.
  The check result for each channel is displayed when the JOG dial is turned after performing ALL check.

(5) Push the MENU button when terminating the menu.
To execute the check again in this menu, return to step (2).

Note

To change the playback tape, push the SET button while pressing the EJECT button. The tape is then ejected without influencing the check result. Insert another tape and push the PLAY button. The check is then initiated. This operation does not coincide with the message on the video monitor.

http://getMANUAL.com

Examples of display and operation

When ALL is selected in C11 : PB CH CONDITION.

Video monitor

```
C11:PB CH CONDITION

Auto Check (Push SET)

ch  RSLT    ch  RSLT
A1          B1
A2          B2
A3          B3
*ALL
```

FL display panel

```
C11 -ALL
```

(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ Select
(3) ⇩ SET

```
C11:PB CH CONDITION

Auto Tracking ...

ch  RSLT    ch  RSLT
A1          B1
A2          B2
A3          B3
*ALL
```

⇩

```
C11:PB CH CONDITION

Auto Checking ...

ch  RSLT    ch  RSLT
A1          B1
A2          B2
A3          B3
*ALL
```

⇩

```
C11:PB CH CONDITION

Auto Check Complete

ch  RSLT    ch  RSLT
A1  GRN     B1
A2          B2
A3          B3
*ALL
```

⇩

```
C11:PB CH CONDITION

Auto Tracking ...

ch  RSLT    ch  RSLT
A1  GRN     B1
A2          B2
A3          B3
*ALL
```

⇩

(omitted)

⇩

(continue)

(continued)

⇩

```
C11:PB CH CONDITION

Auto Check Complete

ch  RSLT    ch  RSLT
A1  GRN     B1  GRN
A2  GRN     B2  GRN
A3  GRN     B3  GRN
*ALL GRN
```

FL display panel

```
C11 -ALL GRN
```

(4) ⇩ Check
(5) ⇩ MENU

For Channel Condition NG

Check, recheck, and clean the drum (video heads) according to the procedures below.

(1) If a check is performed using alignment tapes other than SR5-1/SR5-1P, recheck using alignment tape SR5-1/SR5-1P.
If no abnormality is found, the check is completed.
Note
If no abnormality is found during check using an alignment tape, a trouble (tape is damaged or recording is not done properly) is considered to exist in the previously played back tape portion.
(2) Change the playback portion on the alignment tape, then recheck.
If no abnormality is found, the recheck is completed.
(3) Recheck using an alignment tape after performing the cleaning using a cleaning tape (in Section 4-2-1).
If no abnormality is found, the recheck is completed.
(4) Recheck using an alignment tape after performing the cleaning using a cleaning tape again (the amount of the tape used is 15 seconds).
If no abnormality is found, the recheck is completed.
(5) Recheck using an alignment tape after performing the cleaning with cleaning cloth (in Section 4-2-3).
If no abnormality is found, the recheck is completed.

If the error condition is not improved in the way mentioned above, the possible cause below are considered.

- VTR's servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system. (A0 : SERVO ADJUST)
  ⇨ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- RF system adjustment defect
  ⇨ Readjust the RF system. (A1 : RF ADJUST)
- Worn PB head in the drum assembly
  ⇨ After confirming the hours meter (H02 : DRUM RUNNING HOURS), replace the upper drum assembly or drum assembly as required.
  (Refer to the Section 5-2, 5-5.)
- Adjustment defect in tape transport system or component part installation defect.
  ⇨ Readjust the tape transport system or reinstall the parts.
  (Refer to the Section 7.)
- EQ-72 board defect
- Drum assembly defect

For Check Failure

Change the playback portion on the tape, then recheck.
If no check failure occurs again, a trouble is considered to exist in the previously played back portion.

Cassette tape check

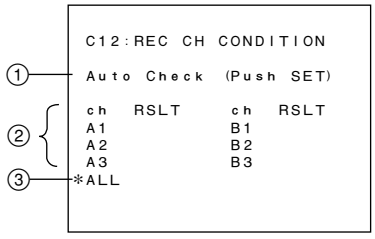
Check failure occurs if the no-recorded portion is played back or the recording format is not in Betacam SX.
Moreover, check failure will also occur on the tape recorded by the failled Betacam SX VTR. Confirm that the tape can be correctly played back by the other normal operating Betacam SX VTR.

If no trouble is found on the played back tape

The possible cause below are considered.

- Heads clogging
  ⇨ Perform steps (1) to (5) of “For Condition NG” on previous page.
- VTR’s servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system. (A0 : SERVO ADJUST)
  ⇨ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- Brush/slip ring assembly defect or its part installation/connection defect
  ⇨ Replace or reinstall the brush/slip ring assembly. (Refer to the Section 5-3, 5-4.)
- Harness (between EQ-72 board and drum assembly) connection defect
- RF system adjustment defect
  ⇨ Readjust the RF system. (A1 : RF ADJUST)
- EQ-72 board defect
- Drum assembly defect

C12 : REC CH CONDITION



In this menu, the error condition for each channel is displayed in three steps (GRN, YEL, and RED) when the tape recorded based on a Betacam SX format is played back using the advance PB heads (A1, A2, B1, and B2) by tracking in the insert REC mode, and played back using the confidence PB heads (A3 and B3) in the crash REC mode.
C12 checks using the PB signal from the PB heads (A1, A2, A3, B1, B2, and B3) in the REC mode.

Notes

- Display the channel condition of the A3 and B3 heads in the CH CONDITION area on the FL display panel when selecting the CONFIDENCE PB MODE to ON in the crash REC mode.
- During normal operation, the tape is played back by non-tracking. Therefore, the condition for each channel cannot be confirmed using a CH CONDITION indicator.
- If abnormality exists in the servo system of a VTR, each menu of C1 : RF CHECK does not function normally.

Description of video monitor

① The display in this line changes. Each display and its meaning are described below.

Auto Check (Push SET) :	Push the SET button to start the check.
Insert Check Tape :	Insert a tape for check.
Auto Tracking... :	Tracking is in an optimization process.
Auto Checking... :	Check is in progress.
Auto Check Complete :	Check is completed.
Auto Check Failure :	Check failure
Condition NG :	Error condition defect
Waiting ... :	Insert the pre-recorded tape conformed with the Betacam SX format.

② Select using a * mark when checking the condition for each channel.
After the check is completed, the condition (GRN, YEL, or RED) is displayed on the right of a channel name. “RED” is displayed even if the check fails.

Note

“RSLT” indicates the result.

③ Select ALL when checking the condition for all channels.
During check, the condition in each channel is displayed for area ②.
After the check for all channels is completed, “GRN” is also displayed on the right of ALL if the condition for all channels is GRN. If there is at least one channel whose condition is YEL or RED, the worst condition is displayed on the right of ALL.

To execute the check

(1) Insert the lignment tape SR5-1 (for a 525/60 system) or SR5-1P (for a 625/50 system).

Notes

- When the tape other than the specified format, such as blank tape, undefined format tape, etc. is inserted, the message “Waiting ...” is displayed on the video monitor. Be sure to insert the specified tape in which recorded by the Betacam SX format.
- The tape amount on the recorded portion that is played back after a cassette tape is inserted must exceed the check execution time. Before check, record a data on blank tape for two minutes or more. The recorded data is rewritten to new data in this menu execution.
  The check execution time for each channel is usually about ten seconds and about 80 seconds in an ALL check.

(2) Turn the JOG dial and move the ∗ mark to the channel to be checked or ALL.
- Usually, select ALL.

(3) Push the SET button.
- The tape is automatically recorded back in the REC mode. The check is then initiated.
- Message “Auto Tracking ...” or “Auto Checking ...” is displayed on the video monitor.
  During ALL check execution, the check result in the channel is displayed every time a one-channel check is completed.
  The FL display panel displays an ordinary time counter.
- To cancel the check, push the MENU button.

Notes

- Message “Insert Check Tape” is displayed on the video monitor when no cassette tape is inserted. The tape is automatically played back in the PLAY mode when a cassette tape is inserted. The check is then initiated.
- If message “Auto Check (Push SET)” is continuously displayed on the video monitor, the non-recorded portion on the tape is judged to be recorded from the beginning. Change the record position on the tape.
- Check operation cannot be properly performed in modes other than REC mode. Leave the check as it is until automatic check is completed. If modes other than REC mode are entered, the check cannot be performed any longer or the condition becomes “RED”.

(4) Check to see the check result on the video monitor.
- If no abnormality is found, “GRN” is displayed on the right of the selected channel or ALL.
- Refer to the “For Check Failure” on page 3-34 when message “Auto Check Failure” is displayed on the video monitor.
- Refer to the “For Condition NG” on page 3-33 when message “Condition NG” is displayed on the video monitor or when conditions other than “GRN” are displayed on the right of the checked channel.

Notes

- Refer to the “For Check Failure” on page 3-34 when the check result in all channels is “RED” even if message “Condition NG” is displayed on the video monitor during ALL check execution.
- “GRN”, “YEL”, or “RED” is displayed in a FL display panel. In only the FL display panel, it cannot be confirmed whether the condition is NG or check failure when it is “RED”.
  The check result for each channel is displayed when the JOG dial is turned after performing ALL check.

(5) Push the MENU button when terminating the menu.
To execute the check again in this menu, return to step (2).

Note

To change the playback tape, push the SET button while pressing the EJECT button. The tape is then ejected without influencing the check result. Insert another tape and push the PLAY button. The check is then initiated. This operation does not coincide with the message on the video monitor.

Examples of display and operation

When ALL is selected in C12 : REC CH CONDITION.

Video monitor

```
C12:REC CH CONDITION

Auto Check (Push SET)

ch  RSLT    ch  RSLT
A1          B1
A2          B2
A3          B3
*ALL
```

FL display panel

```
C12 -ALL
```

(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ Select
(3) ⇩ SET

```
C12:REC CH CONDITION

Auto Tracking ...

ch  RSLT    ch  RSLT
A1          B1
A2          B2
A3          B3
*ALL
```

⇩

```
C12:REC CH CONDITION

Auto Checking ...

ch  RSLT    ch  RSLT
A1          B1
A2          B2
A3          B3
*ALL
```

⇩

```
C12:REC CH CONDITION

Auto Check Complete

ch  RSLT    ch  RSLT
A1  GRN     B1
A2          B2
A3          B3
*ALL
```

⇩

```
C12:REC CH CONDITION

Auto Tracking ...

ch  RSLT    ch  RSLT
A1  GRN     B1
A2          B2
A3          B3
*ALL
```

⇩

(omitted)

⇩

(continue)

(continued)

⇩

```
C12:REC CH CONDITION

Auto Check Complete

ch  RSLT    ch  RSLT
A1  GRN     B1  GRN
A2  GRN     B2  GRN
A3  GRN     B3  GRN
*ALL GRN
```

(4) ⇩ Confirm
(5) ⇩ MENU

FL display panel

```
C12 -ALL GRN
```

For Channel Condition NG

Check, recheck, and clean the drum (video heads) according to the procedures below.

(1) If no abnormality is found during PB CH CONDITION check but abnormality is found during REC CH CONDITION check, perform as follows.
- Readjust the recording current.
- Record a data again for two minutes or more.
- Perform the REC CH CONDITION check.

If no abnormality is found, recheck and readjustment are completed.

Note

The data is overwritten on a cassette tape in REC CH CONDITION check.
Before check, record a data on a blank tape for two minute or more.

(2) After that, perform the REC CH CONDITION check after recording a data again for two minutes or more. Perform the cleaning using a cleaning tape
(in Section 4-2-1).
If no abnormality is found, the recheck is completed.

(3) After that, perform the REC CH CONDITION check after recording a data again for two minutes or more. Perform the cleaning using a cleaning tape again (the amount of the tape used is 15 seconds).
If no abnormality is found, the recheck is completed.

(4) After that, perform the REC CH CONDITION check after recording a data again for two minutes or more. Perform the cleaning with cleaning cloth
(in Section 4-2-3).
If no abnormality is found, the recheck is completed.

If the error condition is not improved in the way mentioned above, the possible cause below are considered.

- VTR’s servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system. (A0 : SERVO ADJUST)
  ⇨ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- Worn PB head in the drum assembly
  ⇨ After confirming the hours meter (H02 : DRUM RUNNING HOURS), replace the upper drum assembly or drum assembly as required.
  (Refer to Section 5-2, 5-5.)
- Adjustment defect in tape transport system or component part installation defect.
  ⇨ Readjust the tape transport system or reinstall the parts
  (Refer to Section 7.)
- EQ-72 board defect
- Drum assembly defect

For Check Failure

Change the record portion on the tape, then recheck.
If no check failure occurs again, a trouble is considered to exist in the previously recorded portion.

Confirmation of cassette tape

Check failure occurs if the no-recorded portion is recorded or the recording format is not in Betacam SX. Moreover, check failure will also occur on the tape recorded by the failled Betacam SX VTR. Confirm that the tape recorded by this unit can be correctly played back.

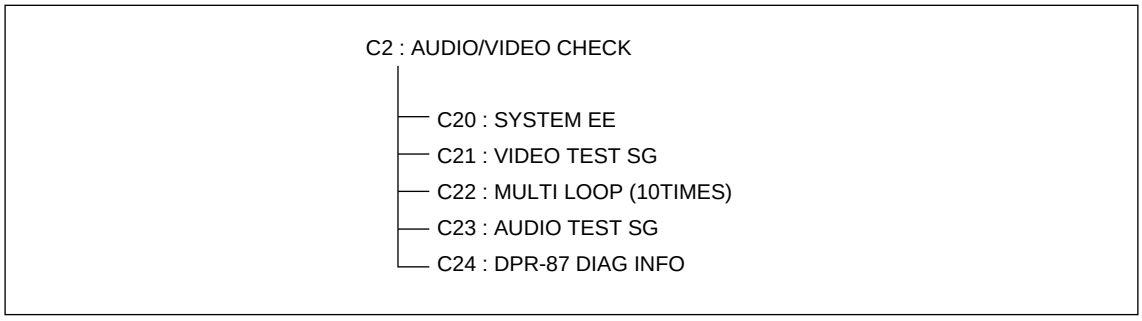
If no trouble is found on the played back tape

The possible cause below are considered.

- Heads clogging
  ⇨ Perform steps (1) to (5) of “For Condition NG” on previous page.
- VTR’s servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system. (A0 : SERVO ADJUST)
  ⇨ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- Brush/slip ring assembly defect or its part installation/connection defect
  ⇨ Replace or reinstall the brush/slip ring assembly. (Refer to Section 5-3, 5-4.)
- Harness (between EQ-72 board and drum assembly) connection defect
- EQ-72 board defect
- Drum assembly defect

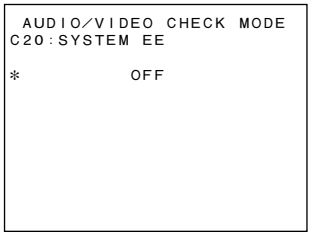
3-2-4. AUDIO/VIDEO CHECK Mode (C2)

The C2 : AUDIO/VIDEO CHECK mode has four menus that are useful for checking audio and video systems.



Menu Tree of Audio/Video Systems Check Mode

C20 : SYSTEM EE



This menu selects the system E-E function to be enabled or disable in the maintenance mode, and additionally selects a signal path from among the followings when the system E-E function is enabled.

OFF: Normal state (in which the system E-E state is not entered)
ECC-EE: Reflects the signal after it passes through IC35 (ECC encoder) on the DPR-87 board.
RF-EE: Reflects a signal in the EQ-72 board.

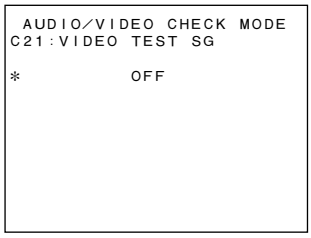
System E-E setting

To set the system E-E function, press and turn the JOG dial, and display the desired setting.
The specified setting is maintained until the maintenance mode is terminated or the setting is changed.

Notes

- This menu is set to OFF when the maintenance mode is activated.
- Be sure to perform under the next state when selecting the system E-E to enable:
  Eject a cassette tape

C21 : VIDEO TEST SG



This menu selects the operation in the maintenance mode of a video test signal generator incorporated into this unit.

OFF: The video test signal generator operation stops.
Except OFF: A video test signal generator outputs the selected signals (below).

100% color bars	75% color bars
75% reverse color bars	
Bowtie	Pulse and bar
Multi-burst	H sweep
5-step	Ramp
Shallow ramp	Red signal
50% flat	100% flat
Black burst	
Pathological check code	
NTC7 (NTSC) ⇦ Only for 525/60 system	
Line330 (625) ⇦ Only for 625/50 system	

Setting of video test signal generator

To set the system E-E function, press and turn the JOG dial, and display the desired setting.
This setting is valid until the maintenance mode is terminated. However, the C21 : VIDEO TEST SG setting is reset to OFF when the C22 : MULTI LOOP (10TIMES) setting is changed.

Notes

- This menu is set to OFF when the maintenance mode is activated.
- The output signal of a test signal generator can also be recorded on the tape. In this case, push the SET button and perform the recording operation with the white square is displayed in the upper-right position of the video monitor.

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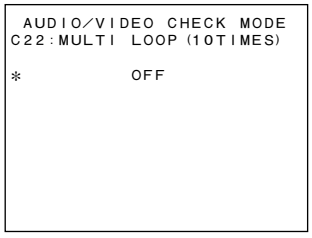
C22 : MULTI LOOP (10TIMES)



This menu selects the multi-loop function enabled or disabled in the maintenance mode, and additionally selects a video test signal when the multi-loop function is enabled.
The video test signal that can be selected is output from an internal video test signal generator. The video test signal is the same in type as one described in a C21 : VIDEO TEST SG menu.

OFF: Normal state (in which no multi-loop operation is performed)
Except OFF: The selected signal is output from a video test signal generator for multi-loop operation.

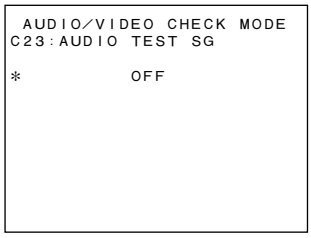
Multi-loop function setting

To set the system E-E function, press and turn the JOG dial, and display the desired setting.
This setting is valid until the maintenance mode is terminated. However, the C22 : MULTI LOOP (10TIMES) setting is reset to OFF when the C21 : VIDEO TEST SG setting is changed.

Notes

- This menu is set to OFF when the maintenance mode is activated.
- The output signal during multi-loop operation can also be recorded on the tape or hard disk. In this case, push the SET button and perform the recording operation with the white square is displayed in the upper-right position of the video monitor.

C23 : AUDIO TEST SG



This menu selects the operation in the maintenance mode of an audio test signal generator incorporated in this unit.

OFF: The audio test signal generator operation stops.
Except OFF: An audio test signal generator outputs the selected signals (below).
Silence
1 kHz sine 0 VU
1 kHz sine burst/1 field
1 kHz sine burst/2 field
1 kHz sine burst/5 field
1 kHz sine burst/8 field
1 kHz sine burst(10)
1 kHz sine burst(40)
Saw wave

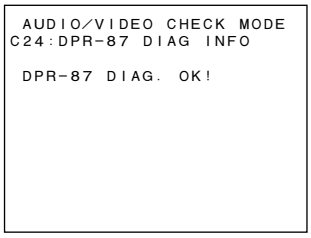
Setting of audio test signal generator

To set the system E-E function, press and turn the JOG dial, and display the desired setting.
This setting is valid until the maintenance mode is terminated.

Notes

- This menu is set to OFF when the maintenance mode is activated.
- The output signal of a test signal generator can also be recorded on the tape. In this case, push the SET button and perform the recording operation with the white square is displayed in the upper-right position of the video monitor.

C24: DPR-87 DIAG INFO



This function informs the result of the self-diagnosis of the DPR-87 board incorporated in to this unit. When a failure occurs on the DPR-87 board, this function guess the default IC but do not specified.

Note

"Error" may be displayed as the diagnosis result even if the boards except DPR-87 are defective.

An initialize check and something check are available as the self-diagnosis function.
In the initialize check, check the communication between SY2 CPU on the SY-260 board and the communication buses (PAD< STAT, STRB, and CS) of each IC.
Initialization data is transferred from SY2 CPU to each IC. After that, the initialization data set in each IC is read and compared with the initialization data transferred at first.

In the something check, a parity check, external memory check, and clock check are performed for the input signals of the following ICs, and the result of the self-diagnosis of each IC is displayed by reading from SY2 CPU on the SY-260 board.

IC to be treated for diagnosis

No.	Screen display	IC name	Reference
1	F-CONT	CXD8997R	IC3
2	DIGI FIL	CXD9025R	IC19
3	SX ENC	CXD8973BR	IC20
4	SX MEP	CXD8974AR	IC26
5	ECC ENC	CXD8946Q	IC35
6	OUTER	CXD8945BR	IC39
7	SX DEC	CXD9012AR	IC45

To display the self-diagnosis function result

(1) Select the C24 : DPR-87 DIAG INFO menu.

(2) To scroll the screen, turn the JOG dial.
To scroll the screen downward, turn the JOG dial downward.
To scroll the screen upward, turn the JOG dial upward.

(3) Press the MENU button to terminate the menu after confirming the self-diagnosis result.

Screen display samples of check result

In case of normal

```
  AUDIO/VIDEO CHECK MODE
C24:DPR-87 DIAG INFO

  DPR-87 DIAG. OK!

  INITIALIZE CHECK..
  1.F-CONT     INIT.      OK
  2.DIGI FIL   INIT.      OK
  3.SX ENC     INIT.      OK
  4.SX MEP     INIT.      OK
  5.ECC ENC    INIT.      OK
  6.OUTER      INIT.      OK
  7.SX DEC     INIT.      OK

  SOMETHING CHECK..
  11.F-CONT    CHECK.  OK
  12.DIGI FIL  CHECK.  OK
  13.SX ENC    CHECK.  OK
  14.SX MEP    CHECK.  OK
  15.ECC ENC   CHECK.  OK
  16.OUTER     CHECK.  OK
  17.SX DEC    CHECK.  OK
```

In case of abnormal

```
  AUDIO/VIDEO CHECK MODE
C24:DPR-87 DIAG INFO

  DPR-87 DIAG. ERROR!

  INITIALIZE   CHECK..
  1.F-CONT     INIT.      OK
  2.DIGI FIL   INIT.      OK
  3.SX ENC     INIT.      NG
  4.SX MEP     INIT.      OK
  5.ECC ENC    INIT.      OK
  6.OUTER      INIT.      OK
  7.SX DEC     INIT.      OK

  SOMETHING CHECK..
  11.F-CONT    CHECK.  NG
       PARITY ERR    B-IN
       PARITY ERR    A-IN
  12.DIGI FIL  CHECK.  OK
  13.SX ENC    CHECK.  NG
       PARITY ERR    MEP
  14.SX MEP    CHECK.  OK
  15.ECC ENC   CHECK.  OK
  16.OUTER     CHECK.  OK
  17.SX DEC    CHECK.  OK
```

} Displays NG for failure item.

} In case of NG, the detail data is displayed.

Detail description when the execution result is abnormal

INITIALIZE CHECK

The possible cause below is judged as an NG item. The numeral number in parentheses is the pin number connected to SY2 CPU.

- IC is defective.
- The foiled pattern on the board connecting IC and SY2 CPU on the SY-260 board is defective.
- The component part between IC and SY2 CPU on the SY-260 board is defective.

The numeral number in parentheses is the pin number connected to SY2 CPU.

1.F-CONT	INIT. NG	:	IC3 (Pins 109 to 116, and 118 to 121)
2.DIGI FIL	INIT. NG	:	IC19 (Pins 113 to 116, and 118 to 125)
3.SX ENC	INIT. NG	:	IC20 (Pins 128, 133 to 135, 141 to 144, and 146 to 149)
4.SX MEP	INIT. NG	:	IC26 (Pins 128, 133, 134, 141 to 144, and 146 to 149)
5.ECC ENC	INIT. NG	:	IC35 (Pins 45, and 49 to 59)
6.OUTER	INIT. NG	:	IC39 (Pins 9 to 16, and 20 to 23)
7.SX DEC	INIT. NG	:	IC45 (Pins 44 to 47, 53 to 59, and 62)

SOMETHING CHECK

The possible cause below is judged as an NG item.

- IC is defective.
- The foiled pattern on the board connecting IC and its connected IC is defective.
- The component part between IC and its connected IC is defective.
- Connected IC is defective.

The numeral number in parentheses is the pin number connected of the IC. The alphanumeric character in parentheses is the IC number to which each pin is connected.

11.F-CONT CHECK. NG		
PARITY ERR B-IN	:	IC3 (Pins 94 to 101, and 103 to 106)
PARITY ERR A-IN	:	IC3 (Pins 74 to 80, and 82 to 88), [IC45]
12.DIGI FIL CHECK. NG		
PARITY ERR A-IN	:	IC19 (Pins 3 to 8, and 10 to 17), [IC3]
13.SX ENC CHECK. NG		
PARITY ERR MEP	:	IC20 (Pins 165, 168 to 173, 175 to 179, 182 to 186, 189 to 192, and 195 to 199), [IC26]
PARITY ERR VIDEO	:	IC20 (Pins 88, 89, 92 to 99, 100, 101, 105, and 106), [IC19]
CLOCK ERR 13.5M	:	IC20 (Pins 110 to 113, 116, and 121 to 127)
CLOCK ERR 27M	:	
CLOCK ERR 54M	:	
CLOCK ERR 81M	:	
SDRAM ERR ALL	:	IC20, [IC21 to IC24]

Note

Displays “ALL” wherever an abnormal point occurs.

14.SX MEP CHECK. NG

SDRAM ERR ALL	:	IC26, [IC28 to IC31]
		Note
		Displays “ALL” wherever an abnormal point occurs.
INPUT ERR PARITY	:	IC26 (Pins 238 to 241, 244 to 247, 250, and 251), [IC20]
INPUT ERR SYNC	:	IC26 (Pin 238)
CLOCK ERR 81M	:	IC26 (Pins 107, 111 to 113, 116, and 121 to 127)
CLOCK ERR 54M	:	
CLOCK ERR 27M	:	
CLOCK ERR 13.5M	:	
PLL ERR 81M	:	
PLL ERR 54M	:	
PLL ERR 27M	:	

15.ECC ENC CHECK. NG

MACRO SEQ ERR	:	IC35 (Data is abnormal)
EXT FIFO FULL WARN	:	
PACK2 NOT FIN ERR	:	
SDRAM ERR	:	IC35, [IC36]
EXT FIFO ERR B	:	IC35, [IC33]
EXT FIFO ERR A	:	IC35, [IC32]
PARITY ERR SX-IN	:	IC35 (Pins 60 to 69), [IC20]
PARITY ERR AUD-0	:	IC35 (Pin 140)
PARITY ERR AUD-1	:	IC35 (Pin 141)

16.OUTER CHECK. NG

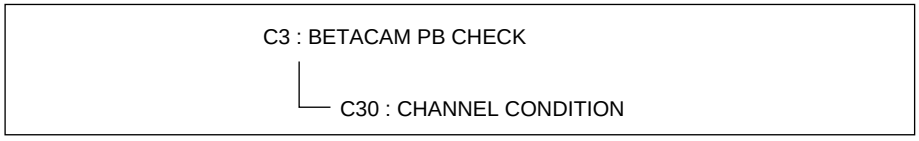
PARITY ERR FF	:	IC39 (Pins 49, 50, 57 to 59, 62 to 66)
SDRAM ERR NT	:	IC39, [IC42]
SDRAM ERR JOG	:	IC39, [IC40, IC41]

17.SX DEC CHECK. NG

SDRAM ERR ALL	:	IC45, [IC46, IC47]
		Note
		Displays “ALL” wherever an abnormal point occurs.
PARITY ERR MEP	:	IC45 (Internal connection of IC45)
PARITY ERR STREAM	:	IC45 (Pins 88 to 95, 98, and 112)
CLOCK ERR 13.5M	:	IC45 (Pins 99, 120 to 124, and 127 to 132)
CLOCK ERR 27M	:	
CLOCK ERR 54M	:	
CLOCK ERR 81M	:	

3-2-5. BETACAM PB CHECK Mode (C3)

The C3 : BETACAM PB CHECK mode is used to check the playback RF system based on a Betacam/Betacam SP format.
In this unit, one menu is available.



Menu Tree of BETACAM PB Check Mode

Note

Betacam/Betacam SP PB function of DNW-A28 is for NTSC (525/60) system.
Betacam/Betacam SP PB function of DNW-A28P is for PAL (625/50) system.
But the PB picture of the other video system is easily played back by selecting the setup menu.

C30 : CHANNEL CONDITION

This menu displays the RF level condition of video channels (Y and C) in three steps (GRN, YEL, and RED) when the tape recorded based on a Betacam/Betacam SP format is played back in the PLAY mode.

Note

If abnormality exists in the servo system of a VTR, the C30 : CHANNEL CONDITION menu does not function normally.

To execute the check

(1) Push the SET button.
- A white square is displayed in the upper-right position of the video monitor. The FL display panel displays an ordinary time counter.
- To cancel the check, push the MENU button.

(2) Insert the cassette tape recorded according to the Betacam/Betacam SP format.
(3) Push the PLAY button. (Playing back the tape in the PLAY mode.)
- ">>>" is displayed on the video monitor.

Note

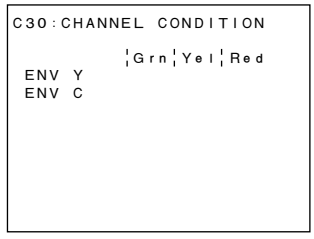
No check can be performed in modes other than PLAY. ">>>" is not displayed even if the portion recorded based on formats other than Betacam/Betacam SP or the non-recorded portion is played back in the PLAY mode.

(4) Check to see that ">>>" is displayed in the "GRN" column of Y and C channels.
- If ">>>" is displayed in columns other than "GRN", refer to the "For Condition NG" on the next page.

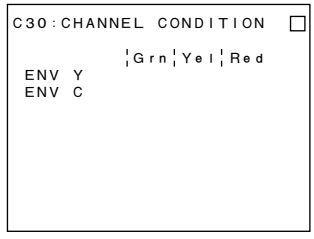
To terminate the check

(5) Stop the tape playback operation, and then eject the cassette.
(6) Push the MENU button.
- The square displayed in the upper-right position of the video monitor disappears.
  The FL display panel displays the former "C30-CHANNEL COND".

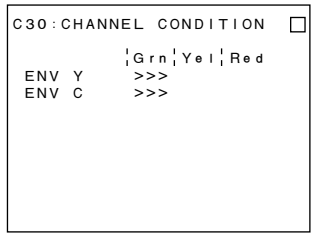
Examples of display and operation



(1) ⇩ SET



(2) ⇩ Insert a recorded tape
(3) ⇩ PLAY



(4) ⇩ Check
(5) ⇩ STOP
⇩ EJECT
(6) ⇩ MENU

For Condition NG

Check, recheck, and clean the drum (video heads) according to the procedures below.

(1) Change the tape playback portion, then recheck.
If no abnormality is found, the recheck is completed.
(2) Perform the cleaning using a cleaning tape (in Section 4-2-1) (the amount of the tape used is five seconds), then recheck.
If no abnormality is found, the recheck is completed.
(3) Perform the cleaning using a cleaning tape again (the amount of the tape used is 15 seconds), then recheck.
If no abnormality is found, the recheck is completed.
(4) Perform the cleaning with cleaning cloth (in Sections 4-2-3), then recheck.
If no abnormality is found, the recheck is completed.
If the condition described above is not improved, the abnormality below is considered to have occurred.

Abnormality on PB tape

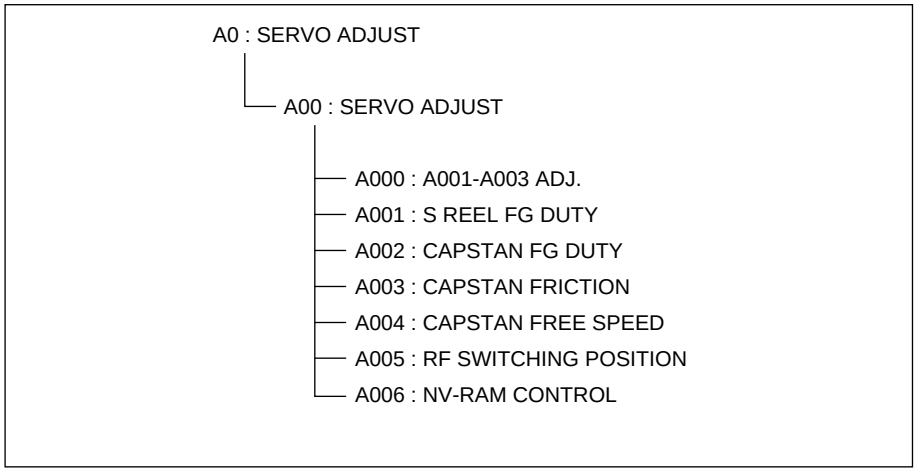
- The tape is damaged.
- The tape cannot be recorded properly.

Abnormality in this unit

- Adjustment defect of Betacam PB system (DM-114/114P board)
  ⇨ Readjust the Betacam PB system. (A3 : BETACAM PB ADJUST)
  (Refer to Section 3-2-9.)
- Adjustment defect in tape transport system or component part installation defect.
  ⇨ Readjust the tape transport system or reinstall the parts.
  (Refer to Section 7.)
- Worn PB head
  ⇨ After confirming the hours meter (H2 : DRUM RUNNING HOURS), replace the upper drum assembly as required.
  (Refer to Section 5-2.)
- Drum assembly defect
- EQ-72 board defect

3-2-6. SERVO ADJUST Mode (A0)

The A0 : SERVO ADJUST mode is used to adjust the servo system.

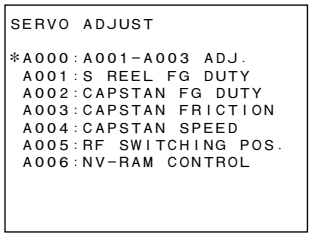

A0 : SERVO ADJUST
A00 : SERVO ADJUST
A000 : A001-A003 ADJ.
A001 : S REEL FG DUTY
A002 : CAPSTAN FG DUTY
A003 : CAPSTAN FRICTION
A004 : CAPSTAN FREE SPEED
A005 : RF SWITCHING POSITION
A006 : NV-RAM CONTROL

Menu tree in servo system adjustment mode

Note

The cassette tape is automatically ejected if the cassette tape inserted into this unit when the A00 : SERVO ADJUST menu is shifted to the lower-level menu.

A00 : SERVO ADJUST



A000 : A001-A003 ADJ.

This menu is used to execute the adjustment menus below automatically and continuously.

A001 : S REEL FG DUTY
A002 : CAPSTAN FG DUTY
A003 : CAPSTAN FRICTION

To execute the adjustment menus

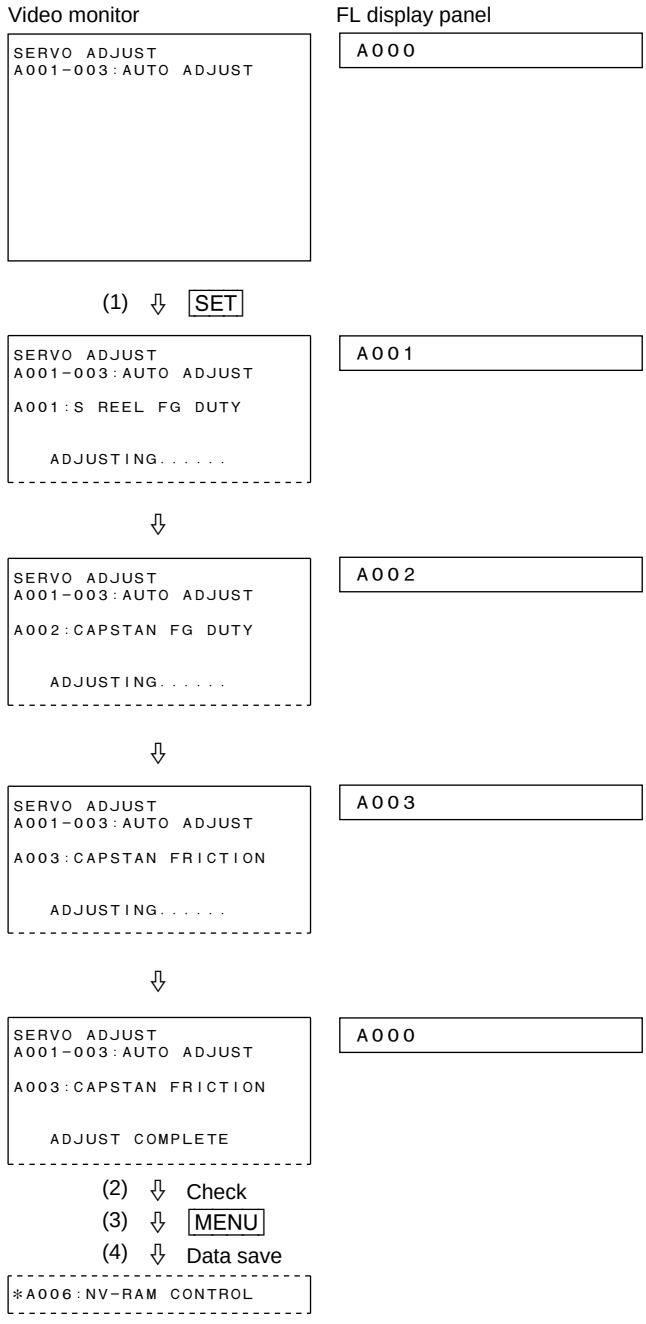
(1) Press the JOG dial or SET button.
- The automatic adjustment is initiated when the JOG dial or SET button is pushed.
  The execution time is about 30 seconds.
- The adjustment menu name in execution and message “ADJUSTING.....” are displayed on the video monitor during automatic adjustment. Only the menu number is displayed in a FL display panel.
- Message “ADJUST COMPLETE” is momentarily displayed on the video monitor when each adjustment menu is completed normally.
  Message “# ADJUST INCOMPLETE #” is displayed on the video monitor when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 2-16 when this message is displayed.

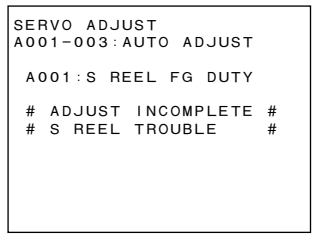
(2) Confirm the adjustment result.
- Message “ADJUST COMPLETE” remains displayed on the video monitor when all adjustments are completed normally.

(3) Press the MENU button to terminate the menu.

(4) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST DATA in an A006 : NV-RAM CONTROL menu.

Examples of display and operation





ex.: When feiling the automatic adjustment

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A001 : S REEL FG DUTY
A002 : CAPSTAN FG DUTY
A003 : CAPSTAN FRICTION

These menus are used to perform the automatic adjustments below.

A001 : S reel FG duty adjustment
A002 : Capstan FG duty adjustment
A003 : Capstan friction adjustment

To execute the automatic adjustments

(1) Press the JOG dial or SET button.
- The automatic adjustment is initiated when the JOG dial or SET button is pushed.
  The execution time is about 15 seconds for A001 to A003.
- Message “ADJUSTING.....” is displayed on only the video monitor during automatic adjustment.

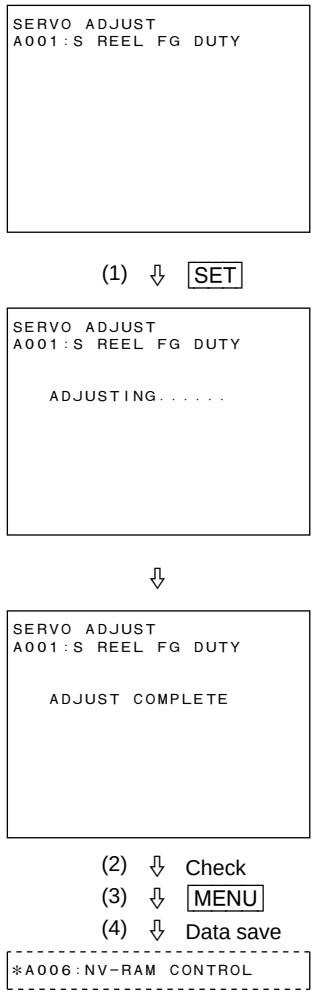
(2) Confirm the adjustment result.
- Message “ADJUST COMPLETE” is displayed on the video monitor when the automatic adjustment is completed normally.
- Message “# ADJUST INCOMPLETE #” is displayed on the video monitor when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 3-50 when this message is displayed.

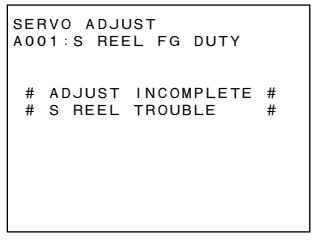
(3) Press the MENU button to terminate the menu.

(4) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST DATA in an A006 : NV-RAM CONTROL menu.

Examples of display and operation

Example of A001 : S REEL FG DUTY





ex.: When failing the automatic adjustment

A004 : CAPSTAN FREE SPEED

This menu is used to perform the automatic adjustment of a capstan free speed.

Notes

- It is necessary to perform this adjustment in both 525/60 and 625/50 system. (As for the 525/625 system switching, refer to Section 1-19-3.)
- In addition, it is necessary to perform this adjustment in both analog and digital modes in each system.

To execute the automatic adjustment

Note

Even though message “SET ALIGNMENT TAPE AND PUSH PLAY KEY” is displayed on the video monitor when this menu is opened, it is not necessary to push the PLAY button.

(1) Insert an alignment tape matched with each system and mode.

SR2-1	(525/60 system, digital mode)
SR2-1P	(625/50 system, digital mode)
CR2-1B	(525/60 system, analog mode)
CR2-1B PS	(625/50 system, analog mode)

- The adjustment is initiated when an alignment tape is inserted.
- Message “ADJUSTING.....” is displayed on only the LCD monitor during automatic adjustment.

Notes

- Be sure to use the specified alignment tape.
  If the specified cassette tape is not used, the adjustment cannot be properly performed even if message “ADJUST COMPLETE” is displayed after it is completed.
- The tape amount on the portion that can be played back after an alignment tape is inserted must exceed the adjustment execution time.
  The adjustment execution time is usually about 15 seconds.

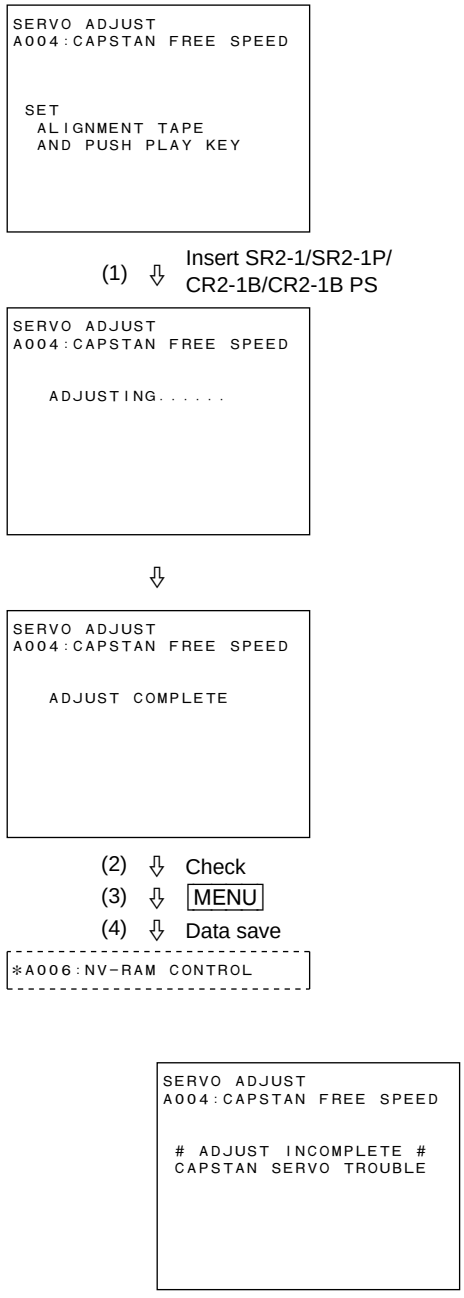
(2) Check the adjustment result.

- Message “ADJUST COMPLETE” is displayed on the video monitor when the automatic adjustment is completed normally.
  An alignment tape is ejected automatically.
- Message “# ADJUST INCOMPLETE #” is displayed on the video monitor when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 3-50 when this message is displayed.

(3) Push the MENU button to terminate the menu.

(4) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST DATA in an A006 : NV-RAM CONTROL menu.

Examples of display and operation



ex.: When failing the automatic adjustment

A005 : RF SWITCHING POS.

This menu is used to adjust the RF switching position automatically or manually. Only the automatic adjustment is described below.

To execute the automatic adjustment

Note

It is necessary to adjust the unit in both 525/60 and 625/50 systems. (Regarding system selection, refer to Section 1-19-3.)
Alignment tapes SR2-1 (for a 525/60 system) and SR2-1P (for a 625/50 system) located in the beginning of time code 00:25:00:00 in advance is required for this adjustment.
If the specified cassette tape is not used, the adjustment cannot be properly performed even if message "ADJUST COMPLETE" is displayed after it is completed.

(1) Make sure that a ∗ mark is assigned to the "AUTO" display on the video monitor, and then push the JOG dial or SET button.
(2) Insert alignment tape SR2-1 (for a 525/60 system) or SR2-1P (for a 626/50 system) located in the beginning of time code 00:25:00:00.
  - The adjustment is initiated when an alignment tape is inserted. The execution time is about 20 seconds.
  - Message "ADJUSTING....." is displayed on only the video monitor during automatic adjustment.

(3) Check the adjustment result.
  - Message "ADJUST COMPLETE" is displayed on the video monitor when the automatic adjustment is completed normally.
    An alignment tape is ejected automatically.
  - Message "# ADJUST INCOMPLETE #" is displayed on the video monitor when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the "For Automatic Adjustment Failure" on page 3-50 when this message is displayed.

(4) Push the MENU button to terminate the menu.
(5) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST DATA in an A006 : NV-RAM CONTROL menu.

Examples of display and operation

Video monitor

```
SERVO ADJUST
A005:RF SWITCHING POS.

*AUTO


    PG DATA:BDF5
```

FL display panel: `A0050`

(1) ⇩ SET

```
SERVO ADJUST
A005:RF SWITCHING POS.

 SET
 SR2-1
 ALIGNMENT TAPE
 TC 00:25:00:00
    PG DATA C000
```

FL display panel: `A011`

(2) ⇩ Insert SR2-1/SR2-1P

```
SERVO ADJUST
A005:RF SWITCHING POS.

   ADJUSTING......


    PG DATA:BFFF
```

FL display panel: `A011`

⇩

```
SERVO ADJUST
A005:RF SWITCHING POS.

   ADJUST COMPLETE


    PG DATA:BDF7
```

FL display panel: `A0011`

(3) ⇩ Check
(4) ⇩ MENU
(5) ⇩ Data save

```
*A006:NV-RAM CONTROL
```

```
SERVO ADJUST
A005:RF SWITCHING POS.

 # ADJUST INCOMPLETE #


    PG DATA:C000
```

ex.: When feiling the automatic adjustment

For Automatic Adjustment Failure

The circuit in which failure occurred can be traced to some degree by the trouble message displayed together when message "# ADJUST INCOMPLETE #" is displayed during execution of adjustment menus A000 to A005.

Note

The trouble message display indicates that no adjustment could be performed because the circuit described in this manual does not operate normally. Moreover, other circuits (e.g., control signal system) in which failure actually occurred may also exist.

A000 : A000-A003 ADJUST

Refer to the description of A001 and A003.

A001 : S REEL FG DUTY

When "S REEL FG AMP TROUBLE" is displayed

⇨ Check the S reel FG amplifier circuit on the SV-194A board.

When "S REEL DRIVER TROUBLE" is displayed

⇨ Check the S reel motor driver circuit on the SV-194A board.

A002 : CAPSTAN FG DUTY

When "CAPSTAN FG AMP TROUBLE" is displayed

⇨ Check the capstan FG amplifier circuit on the SV-194A board.

⇨ Check the capstan motor driver circuit on the SV-194A board.

A003 : CAPSTAN FRICTION

When "T REEL TROUBLE" is displayed

⇨ Check the function cam drive circuit on the SV-194A board.

⇨ Check the function cam sensor circuit on the SV-194A board.

When "SERVO TROUBLE" is displayed

⇨ Check the capstan motor drive circuit on the SV-194A board.

⇨ Check the capstan FG shaping circuit on the SV-194A board.

A004 : CAPSTAN FREE SPEED

Ensure that the played back tape is following alignment tape.

SR2-1 (for a 525/60 system, digital mode)
SR2-1P (for a 625/50 system, digital mode)
SR2-1 (for a 525/60 system, analog mode)
SR2-1P (for a 625/50 system, analog mode)

When "CAPSTAN SERVO TROUBLE" is displayed

⇨ Execute the capstan FG duty adjustment (A002 : CAPSTAN FG DUTY) again.

⇨ Check the capstan FG amplifier circuit and CTL amplifier circuit on the SV-194A board.

When "CAPSTAN DRIVER TROUBLE" is displayed

⇨ Check the capstan motor driver circuit on the SV-194A board.

A005 : RF SWITCHING POS.

Ensure that the played back tape is alignment tape SR2-1 (for a 525/60 system) or SR2-1P (for a 625/50 system).

A006 : NV-RAM CONTROL

The A006
: NV-RAM CONTROL menu is used to save the servo adjustment data adjusted in the SERVO ADJUST mode in the NV-RAM of a servo system.

CAUTION

Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (when "# ADJUST INCOMPLETE #" is displayed).

Note

When adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

To execute the data save

(1) Turn the JOG dial and move the ✻ mark to "SAVE SERVO ADJUST DATA" on the video monitor.
- In a FL display panel, NO OPERATION is displayed as "A0060", and SAVE SERVO ADJUST DATA is displayed as "A0061".

(2) Push the JOG dial or SET button.
- The data transmission is initiated when the SET button is pushed. The data transmission time is about ten seconds.
- Message "SAVING....." is displayed on the video monitor, and "A0061 00" is displayed in the FL display panel

(3) Check that the data transmission is completed.
- After the data transmission is completed, message "DATA SAVED" is displayed on the video monitor and "A0061 10" is displayed in the FL display panel.

(4) Push the MENU button to terminate the menu.

Examples of display and operation

Video monitor / FL display panel

```
SERVO ADJUST
A006:NV-RAM CONTROL

*NO OPERATION
 SAVE SERVO ADJUST DAT
```
A0060

(1) ⇩ DIAL (⇩)

```
SERVO ADJUST
A006:NV-RAM CONTROL

 NO OPERATION
*SAVE SERVO ADJUST DATA
```
A0061

(2) ⇩ [SET]

```
SERVO ADJUST
A006:NV-RAM CONTROL

 NO OPERATION
*SAVE SERVO ADJUST DATA


      SAVING.....
```
A0061 00

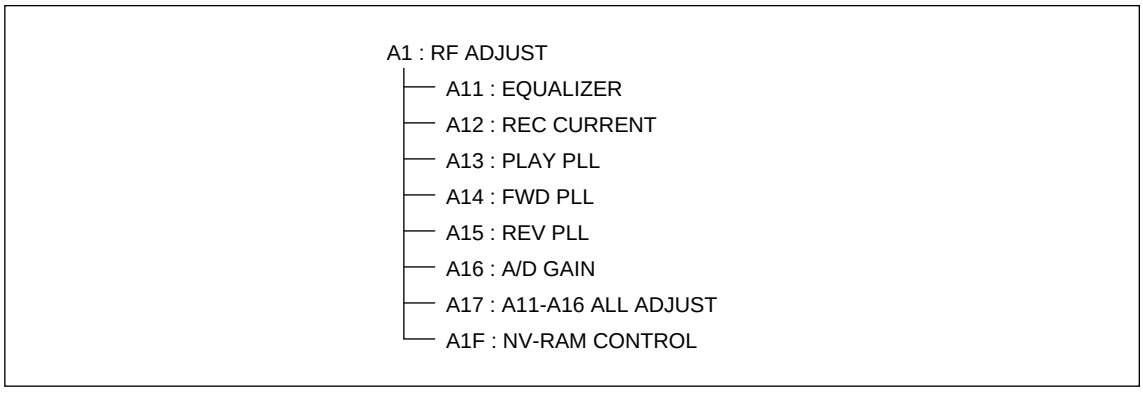
⇩

```
SERVO ADJUST
A006:NV-RAM CONTROL

 NO OPERATION
*SAVE SERVO ADJUST DATA


      DATA SAVED
```
A0061 10

(3) ⇩ Check
(4) ⇩ [MENU]

3-2-7. RF ADJUST Mode (A1)

The A1 : RF ADJUST mode is used to adjust the RF system of a VTR.5/A50P/A45P.


A1 : RF ADJUST
A11 : EQUALIZER
A12 : REC CURRENT
A13 : PLAY PLL
A14 : FWD PLL
A15 : REV PLL
A16 : A/D GAIN
A17 : A11-A16 ALL ADJUST
A1F : NV-RAM CONTROL

Menu Tree of RF System Adjustment Mode

Note

If abnormality exists in the servo system of a VTR, each menu in A1 : RF ADJUST does not function normally.

A11 : EQUALIZER
A12 : REC CURRENT
A13 : PLAY PLL
A14 : FWD PLL
A15 : REV PLL
A16 : A/D GAIN

These menus are used to perform the following automatic adjustments.

A11 : EQUALIZER

This menu automatically adjusts the PB head PB levels (VC) for A1, A2, A3, B1, B2, and B3 channels, and the gain (EQ) and phase (PH) of a PB equalizer.

A12 : REC CURRENT

This menu automatically adjusts the recording current levels for the REC heads (channels A and B).

A13 : PLAY PLL

This menu automatically adjusts the VCO free-running frequency in a PB PLL circuit for PLAY mode.

A14 : FWD PLL

This menu automatically adjusts the VCO free-running frequency in a PB PLL circuit for F FWD mode.

A15 : REV PLL

This menu automatically adjusts the VCO free-running frequency in a PB PLL circuit for REV mode.

A16 : A/D GAIN

This menu automatically adjusts the gain when a PB RF signal is converted from analog to digital.

Right side display is an example of the adjustment data during the STOP button is pressed.
Actually, adjustment data is displayed at the “xx” portion.

```
    RF ADJUST MODE
A11:EQUALIZER

 Auto Adjust (Push SET)

 ch  RSLT    ch  RSLT
 A1          B1
 A2          B2
 A3          B3
*ALL
```

```
    RF ADJUST MODE
A11:EQUALIZER

 Auto Adjust (Push SET)

 ch VC EQ PH ch VC EQ PH
 A1 xx xx xx B1 xx xx xx
 A2 xx xx xx B2 xx xx xx
 A3 xx xx xx B3 xx xx xx
*ALL
```

A11 : EQUALIZER

```
    RF ADJUST MODE
A12:REC CURRENT

 Auto Adjust (Push SET)

 ch  RSLT    ch  RSLT
 A           B
*ALL
```

```
    RF ADJUST MODE
A12:REC CURRENT

 Auto Adjust (Push SET)

 ch   VR     ch   VR
 A    xx     B    xx
*ALL
```

A12 : REC CURRENT

```
    RF ADJUST MODE
A13:PLAY PLL

 Auto Adjust (Push SET)

 ch  RSLT    ch  RSLT
 A           B
*ALL
```

```
    RF ADJUST MODE
A13:PLAY PLL

 Auto Adjust (Push SET)

 ch   VR     ch   VR
 A           B
*ALL
```

A13 : PLAY PLL

```
    RF ADJUST MODE
A14:FWD PLL

 Auto Adjust (Push SET)

 ch  RSLT    ch  RSLT
 A           B
*ALL
```

```
    RF ADJUST MODE
A14:FWD PLL

 Auto Adjust (Push SET)

 ch   VR     ch   VR
 A           B
*ALL
```

A14 : FWD PLL

```
    RF ADJUST MODE
A15:REV PLL

 Auto Adjust (Push SET)

 ch  RSLT    ch  RSLT
 A           B
*ALL
```

```
    RF ADJUST MODE
A15:REV PLL

 Auto Adjust (Push SET)

 ch   VR     ch   VR
 A           B
*ALL
```

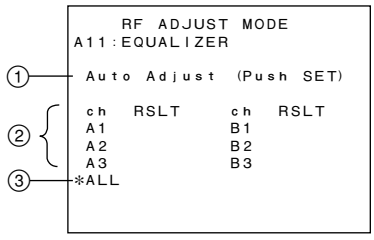
A15 : REV PLL

```
    RF ADJUST MODE
A16:A/D GAIN

 Auto Adjust (Push SET)

 ch  RSLT    ch  RSLT
 A           B
*ALL
```

```
    RF ADJUST MODE
A16:A/D GAIN

 Auto Adjust (Push SET)

 ch   VR     ch   VR
 A           B
*ALL
```

A16 : A/D GAIN

Description of video monitor



ex. A11 : EQUALIZER

① The display in this line changes. Each display and its meaning are described below.
Auto Adjust(Push SET) : Push the SET button to initiate the automatic adjustment.
Insert SR5-1 : Insert an alignment tape.
Insert Blank Tape : Insert the tape on which recording is possible.
Auto Tracking ... : Tracking is in an optimization process.
Auto Adjusting ... : Automatic adjustment is in progress.
Auto Adjust Complete : Automatic adjustment is completed.
Auto Adjust Failure : Automatic adjustment failure
Condition NG : Error condition NG

② To perform the automatic adjustment for each channel (circuit), select using a * mark.
The adjustment result (OK, NG, or FAIL) is displayed on the right of the channel name. “OK” is displayed if the adjustment can be performed normally. “NG” is displayed if the error condition is bad. “FAIL” is displayed if the automatic adjustment fails.

Note

“RSLT” indicates the result.

The adjustment data in each channel (circuit) is displayed while the STOP button is pressed during except adjustment.

Note

Do not push the STOP button during adjustment. The tape stops and the adjustment becomes impossible.

③ To perform the automatic adjustment in all channels (circuits) at a time, select ALL.
After the automatic adjustment in all channels (circuits) is completed, “OK” is displayed on the right of ALL if all channels (circuits) are OK. If there is one channel in which NG or failure occurs, “NG” or “FAIL” is displayed on the right of ALL. If both NG and failure occur in channels, “FAIL” is displayed.

To execute the adjustment

(1) Insert the specified cassette tape.

Notes

- If the specified cassette tape is not used, the adjustment cannot be properly performed even if message “Auto Adjust Complete” is displayed after it is completed. In an A12 : REC CURRENT menu, insert the tape that can be recorded based on a Betacam SX format. In other menus, insert alignment tape SR5-1 (a 525/60 system) or SR5-1P (for a 625/50 system).
- Execute an A12 : REC CURRENT menu with the REC INHIBIT indicator turned off. The cassette tape is ejected when this indicator lights.
  This indicator lights when the REC inhibit plug on the cassette tape is pushed or when the REC INHIBIT switch on the front panel is set to ON.
- Take care that the tape transport mode does not change during automatic adjustment.
  Any adjustment cannot be properly performed in modes other than tape transport that was set automatically. Moreover, in modes other than tape transport, the automatic adjustment cannot be performed any longer or “FAIL” or “NG” is displayed as the adjustment result. Therefore, pay attention to the transport start position of the tape so that the end and beginning of the tape are not detected during adjustment. The minimum tape amount required for normal automatic adjustment is shown in the table below. However, the tape amount increases or decreases when abnormality occurs.

Menu	Ordinary adjustment time	Tape amount required (Transport mode)
A11 : EQUALIZER Ⓣ	About 2 min./ALL, about 15 sec./channel	Adjustment time (PLAY)
A12 : REC CURRENT Ⓣ	About 7 sec./ALL, about 3 sec./channel	Adjustment time (REC)
A13 : PLAY PLL	About 12 sec./ALL, about 10 sec./circuit	Adjustment time (PLAY)
A14 : FWD PLL	About 10 sec.	About 10 min. (F FWD)
A15 : REV PLL	About 10 sec.	About 11 min. (REV)
A16 : A/D GAIN Ⓣ	About 90 sec./ALL, about 10 sec./circuit	Adjustment time (PLAY)

In a menu with Ⓣ, tracking operation is performed.

(2) Turn the JOG dial and move the ∗ mark to the channel to be adjusted or ALL.
- Usually, select ALL.

(3) Push the SET button.
- The tape runs automatically and the automatic adjustment is initiated.
- Message “Auto Tracking...” (only a menu in which tracking operation is performed) or “Adjusting...” is displayed on the video monitor.

  Note

  When ALL adjustment is performed in the menu in which tracking operation is carried out, the adjustment result of the channel is displayed every time one-channel (circuit) adjustment is completed.
- The FL display panel displays an ordinary time counter.
- To cancel the automatic adjustment, push the MENU button.
- Message “Insert SR5-1” or “Insert Blank Tape” is displayed on the video monitor when no cassette tape is inserted.
  When a cassette tape is inserted, the tape runs automatically and the automatic adjustment is initiated.

Notes

- If message “Auto Adjust (Push SET)” is continuously displayed on the video monitor with the automatic adjustment initiated (the SET button pushed), the non-recorded portion on the tape is judged to be played back from the beginning. Change the playback position on the tape (not including an A12 : REC CURRENT menu).

- Do not touch the button or JOG dial, during automatic adjustment, that influences the tape transport.
  Any adjustment cannot be properly performed when the tape transport state is changed. In this case, the automatic adjustment cannot be performed any longer or “FAIL” or “NG” is displayed as the adjustment result.

(4) Check to see the result of automatic adjustment on the video monitor.
- If no abnormality is found, “OK” is displayed on the right of the selected channel (circuit).
- Refer to the “For Condition NG/Automatic Adjustment Failure” on page 3-60 when “Condition NG” or “Auto Adjust Failure” is displayed on the video monitor.
- To check the adjustment data, push the STOP button.

Note

“OK”, “NG”, or “FAIL” is displayed in a FL display panel.
The adjustment result for each channel (circuit) is displayed when the JOG dial is turned after ALL adjustment is completed.

(5) To terminate the menu, push the MENU button.
To execute the automatic adjustment again in this menu, return to step (2).

(6) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A1F : NV-RAM CONTROL menu.
To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A1F : NV-RAM CONTROL menu.

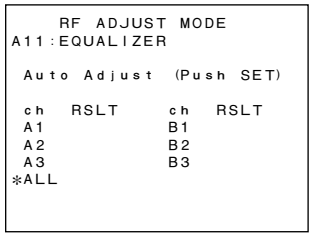
Note

Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (message “Auto Adjust Failure” or “Condition NG” is displayed).

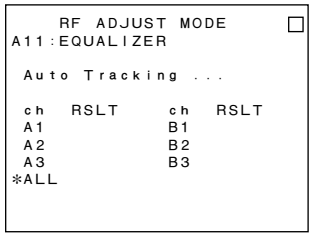
http://getMANUAL.com

Examples of display and operation

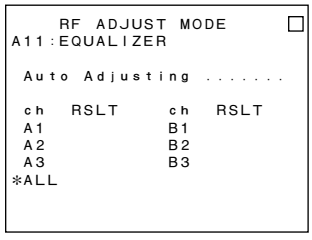
ex.: ALL is selected in
A11 : EQUALIZER.



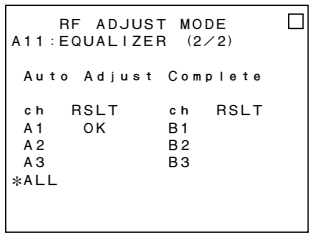
(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ Select
(3) ⇩ SET



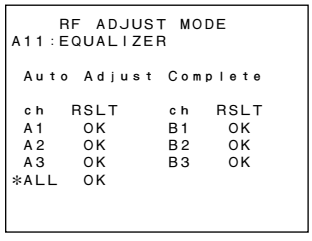
⇩



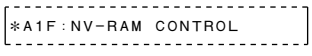
⇩



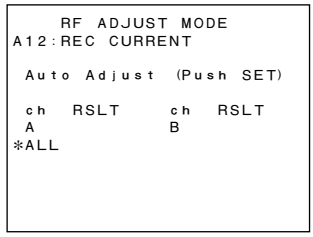
⇩
(omitted)
⇩



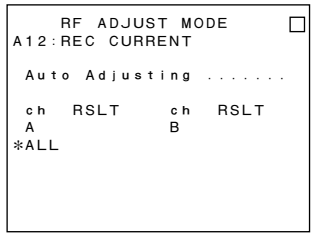
(4) ⇩ Check
(5) ⇩ MENU
(6) ⇩ Data save



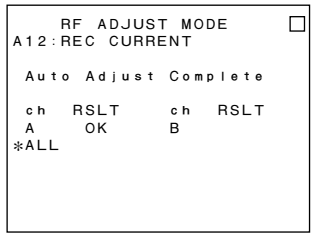
ex.: ALL is selected in
A12 : REC CURRENT.



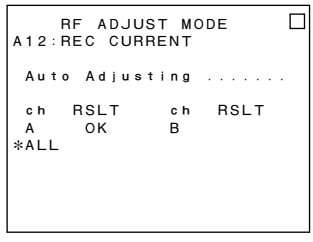
(1) ⇩ Insert a recording tape
(2) ⇩ Select
(3) ⇩ SET



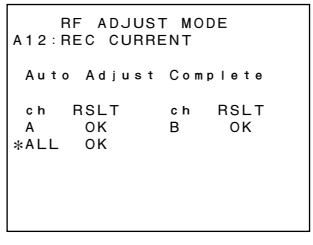
⇩



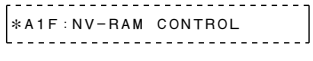
⇩



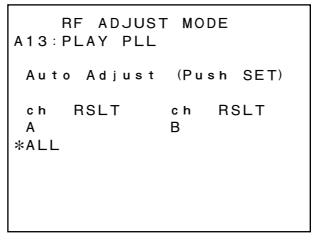
⇩



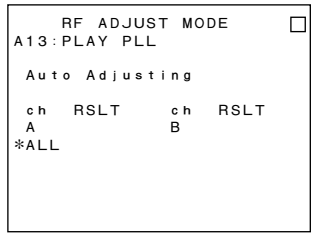
(4) ⇩ Check
(5) ⇩ MENU
(6) ⇩ Data save



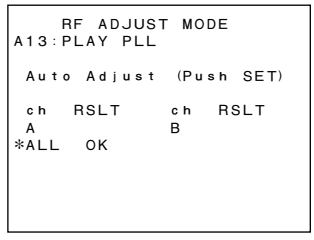
ex.: ALL is selected in
A13 : PLAY PLL.



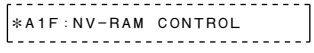
(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ Select
(3) ⇩ SET



⇩



(4) ⇩ Check
(5) ⇩ MENU
(6) ⇩ Data save



A17 : A11-A16 ALL ADJUST

This menu executes the automatic adjustment of A11 to A16 described previously in the following order.

A13: PLAY PLL
A16: A/D GAIN
A11: EQUALIZER
A14: FWD PLL
A15: REV PLL
A12: REC CURRENT

To execute the automatic adjustment

(1) Insert alignment tape SR5-1 (for a 525/60 system) or SR5-1P (for a 625/50 system) that was rewound to the beginning of the tape.

Note

Be sure to use the specified alignment tape.
If the specified cassette tape is not used, the adjustment cannot be performed properly.

(2) Push the SET button.
- The automatic adjustment in a PB system is initiated when the SET button is pushed.
- The video monitor during adjustment is displayed in the same way as when the adjustment is executed independently. If message “Condition NG” or “Auto Adjust Failure” is not displayed, the adjustment in a PB system is completed after about four seconds.
  The alignment tape is rewound when the adjustment is completed. Message “Set a blank tape and push SET button for REC CURRENT adjustment” is displayed on the video monitor.

(3) Eject the alignment tape.
(4) Insert the cassette tape on which recording is possible.
(5) Push the SET button.
- The automatic adjustment (A12 : REC CURRENT) in a REC system is initiated when the SET button is pushed.
- The video monitor during adjustment is displayed in the same way as when the adjustment is executed independently. If message “Condition NG” or “Auto Adjust Failure” is not displayed, the adjustment in a REC system is completed after several seconds.

(6) Check to see that message “Auto Adjust Complete” is displayed on the video monitor.
- Check the adjustment data from each menu.

Note

If abnormality exists during adjustment, message “Condition NG” or “Auto Adjust Failure” is displayed on the video monitor in the same way as when the adjustment is executed independently. The automatic adjustment stops in the adjustment menu. Message “A17-ALL FAIL” or “A17-ALL NG” is displayed in a FL display panel.

- Refer to the “For Condition NG/Automatic Adjustment Failure” on page 3-60 when message “Condition NG” or “Auto Adjust Failure” is displayed.
- To check the adjustment data, press the STOP button.

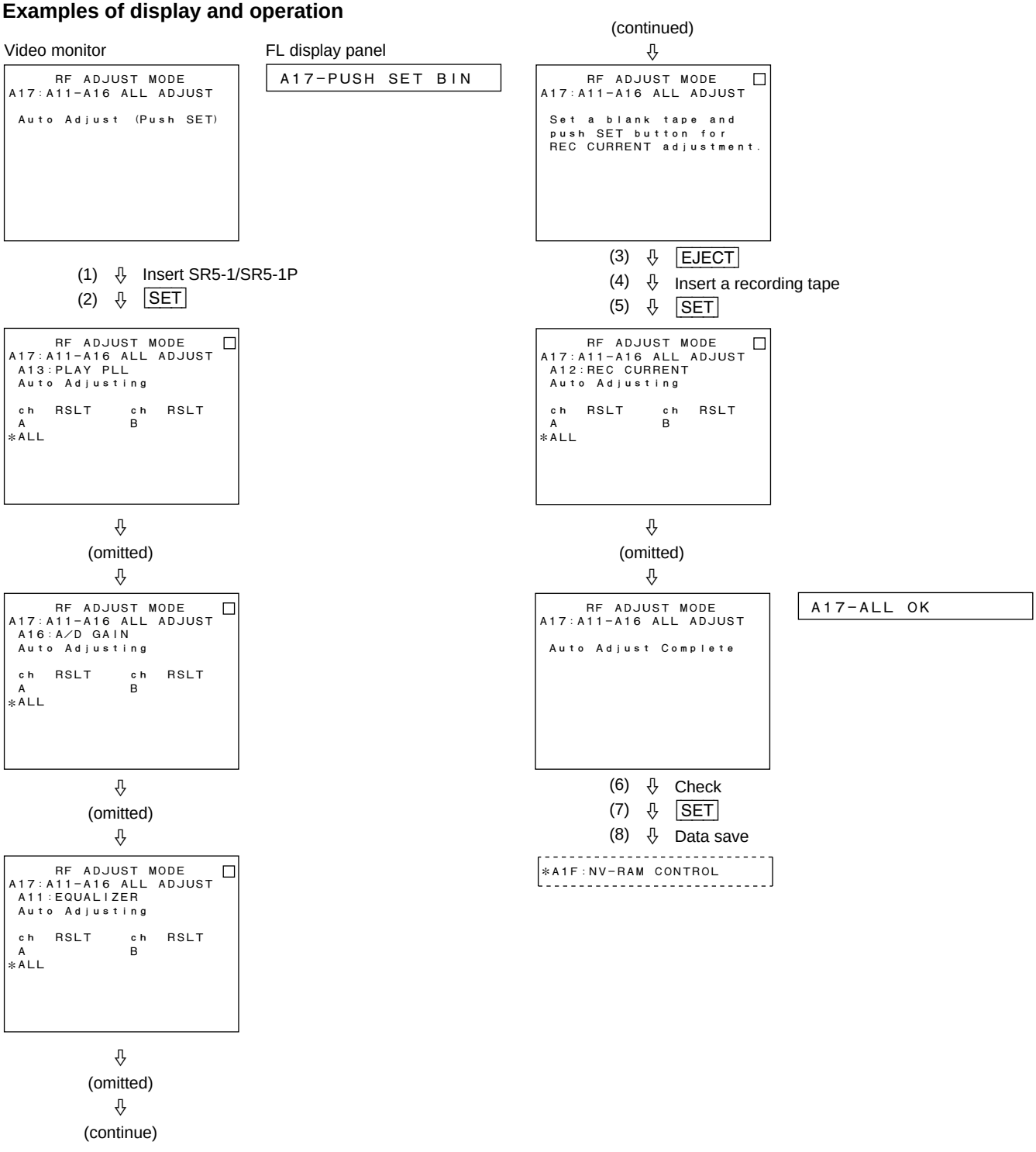
(7) Push the MENU button.
- To execute readjustment, push the MENU button. Select again once the menu is completed.

(8) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A1F : NV-RAM CONTROL menu.
To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A1F : NV-RAM CONTROL menu.

Note

Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (when message “Auto Adjust Failure” or “Condition NG” is displayed).

Examples of display and operation



For Condition NG/Automatic Adjustment Failure

Confirm in the procedure below when message “Condition NG” or “Auto Adjust Failure” is displayed during execution of adjustment menus A11 to A17.

(1) Confirm whether the specified alignment tape is used.
If the specified alignment tape is not used, execute the automatic adjustment by the specified one.
SR5-1 for 525/60 system, SR5-1P for 625/50 system
(2) Clean the drum (rotary head) referring to the “For Condition NG” on page 3-44.
This operation is not required when the drum has been already cleaned.
(3) Perform the automatic adjustment menu A17 when message “Condition NG” or “Auto Adjust Failure” is displayed during execution of menus other than menu A17 or A13.
If no abnormality is found, the adjustment is completed.

If the message “Condition NG” is displayed, the possible cause below are considered.
- VTR’s servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system. (A0 : SERVO ADJUST)
  ⇨ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- RF system adjustment defect
  ⇨ Readjust the RF system. (A1 : RF ADJUST)
- Worn PB head in the drum assembly
  ⇨ After checking the hours meter (H02 : DRUM RUNNING HOURS), replace the upper drum assembly or drum assembly as required. (Refer to Section 5-2, 5-5.)
- Adjustment defect in tape transport system or component part installation defect.
  ⇨ Readjust the tape transport system or reinstall the parts. (Refer to Section 7.)
- EQ-72 board defect
- Drum assembly defect

Or if the message “Auto Adjust Failure” is displayed, the possible above and following cause are considered.
- Brush/slip ring assembly defect or its part installation/connection defect
  ⇨ Replace or reinstall the brush/slip ring assembly. (Refer to Section 5-3, 5-4.)
- Harness (between EQ-72 board and drum assembly) connection defect

A1F : NV-RAM CONTROL

The A1F : NV-RAM CONTROL menu is used to save the RF adjustment data adjusted in the RF ADJUST mode in NV-RAM. The adjustment data of A30 : EQ VR adjusted in the BETACAM PB ADJUST mode is also saved in this menu.
The current adjustment data can return to the former state when “ALL DATA PREVIOUS” is selected before the adjustment data is saved in NV-RAM.

Notes

- Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (when message “Auto Adjust Failure” or “Condition NG” is displayed).
- When the adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

To execute the menu

(1) Turn the JOG dial and move the ∗ mark on the video monitor as described below.
To save the adjustment data after adjustment:
⇨ “SAVE ALL ADJUST DATA”
To return to the adjustment data before adjustment
⇨ “ALL DATA PREVIOUS”
  - In a FL display panel, “SAVE ALL ADJUST DATA” and “ALL DATA PREVIOUS” are displayed as messages “SAVE ALL ADJUST” and “ALL DATA PREVIOUS”, respectively.

(2) Push the SET button.
  - The data transmission is initiated when the SET button is pushed.
  - Message “Saving ...” or “Loading ...” is displayed on the video monitor, and message “SAVING” or “LOADING” is displayed in the FL display panel.

(3) Confirm that the data transmission is completed.
  - After data transmission is completed, message “Save Complete” or “Load Complete” is displayed on the video monitor, and message “SAVE COMPLETE” or “LOAD COMPLETE” is displayed in the FL display panel.

(4) Push the MENU button to terminate the menu.

Examples of display and operation

Video monitor / FL display panel

```
A1F:NV-RAM CONTROL

*NO OPERATION
 SAVE ALL ADJUST DATA
 ALL DATA PREVIOUS
```
NO OPERA TION

(1) ⇩ DIAL (⇩)

```
A1F:NV-RAM CONTROL

 NO OPERATION
*SAVE ALL ADJUST DATA
 ALL DATA PREVIOUS
```
SAVE ALL ADJUST

(2) ⇩ [SET]

```
A1F:NV-RAM CONTROL

Saving ..
```
SAVING

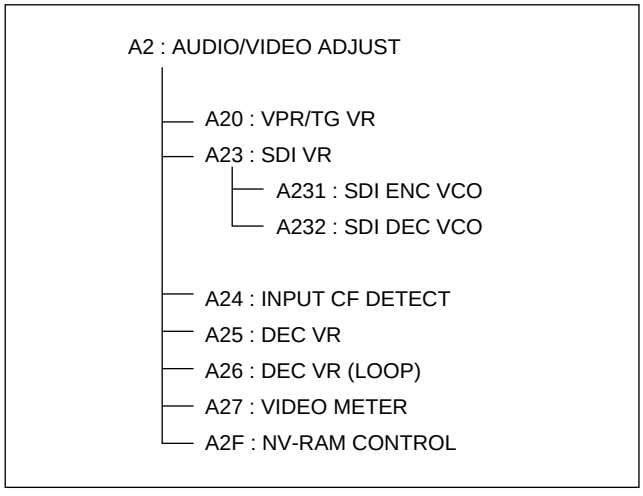
⇩

```
A1F:NV-RAM CONTROL

Save Complete
```
SAVE CO MPLETE

(3) ⇩ Check
(4) ⇩ [MENU]

3-2-8. AUDIO/VIDEO ADJUST Mode (A2)

The A2 : AUDIO/VIDEO ADJUST mode is used to adjust the audio and video systems.
This unit has seven menus.
In A23 : SDI VR menu, two submenus.


A2 : AUDIO/VIDEO ADJUST
A20 : VPR/TG VR
A23 : SDI VR
A231 : SDI ENC VCO
A232 : SDI DEC VCO
A24 : INPUT CF DETECT
A25 : DEC VR
A26 : DEC VR (LOOP)
A27 : VIDEO METER
A2F : NV-RAM CONTROL

Menu Tree of Audio/Video Systems Adjustment Mode

CAUTION

Do not change the adjustment data carelessly. This may cause a trouble. For the actual adjustment, refer to the adjustment method described in Section 9.
If you have changed the adjustment data carelessly, execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu or turn off the power of this unit without selecting an A2F : NV-RAM CONTROL menu.
Never execute SAVE ALL ADJUST DATA.

The adjustment menus other than submenus of A23 and menu A24 are used for manual adjustment.
In the submenus of A23 and menu A24, automatic adjustment (AUTO) or manual adjustment (MANUAL) can be selected.
For the automatic adjustment, refer to the operation example described in each menu.

To change the adjustment data manually

(1) Turn the JOG dial on the video monitor and move the ✻ mark to the item to be adjusted.
Turn the JOG dial in the FL display panel and display the item to be adjusted.
(2) Press and turn the JOG dial.
The adjustment data then increases or decreases.

To execute the automatic adjustment

(1) Turn the JOG dial on the video monitor and move the ✻ mark to “MANUAL”.
Turn the JOG dial in the FL display panel and display “MANUAL”.
(2) Press and turn the JOG dial downward. Message “Auto (Push SET Button)” is then displayed on the video monitor, and message “PUSH SET” is displayed on the FL display panel.
(3) The automatic adjustment is executed when the SET button is pressed.
- Only the display on the video monitor changes as described below. The displayed data value also changes.

Auto adjusting .. :	Automatic adjustment is in progress.
Auto Adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.

To return the adjustment data to the former state

Execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu.

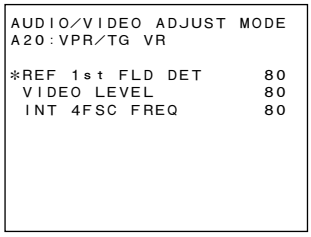
Note

The current adjustment data can not return to the former state after executing SAVE ALL DATA ADJUST DATA.

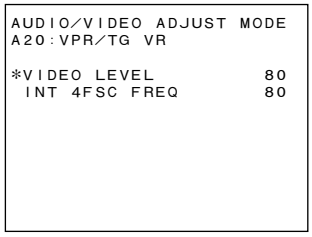
To memorize the adjustment data

Execute SAVE ALL ADJUST DATA in an A2F : NV-RAM CONTROL menu.

A20 : VPR/TG VR



(525/60 System)



(625/50 System)

This menu is used to adjust the reference signal and analog video output systems on the VPR-34 and TG-191 boards. In 525/60 and 625/50 systems, the displayed adjustment items differ.

The adjustment item below can be adjusted in only a 525/60 system.

Adjustment item	Description
REF 1ST FLD DET	First-field detection timing of reference signal

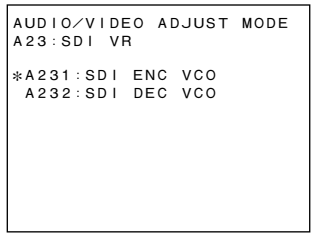
The adjustment item below must be adjusted in both 525/60 and 625/50 systems.

Note

As for the 525/625 system switching, refer to Section 1-19-3.

Adjustment item	Description
VIDEO 1/2 LEVEL	Composite video output (1/2) level
INT 4FSC FREQ	Free-running frequency of internal reference signal 4fsc

A23 : SDI VR



This menu is used to adjust the VCO free-running frequency of SDI input/output interfaces.

Note

Before adjustment, turn the power on and warm up the unit more than ten minutes.

A231 : SDI ENC VCO

This submenu is used for an SDI output interface (SDI encoder).

Note

When select this submenu, mute the SDI output signal.

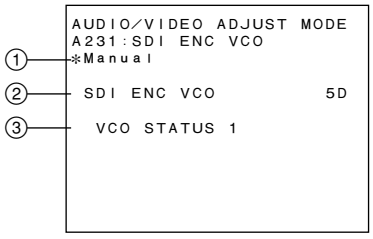
A232 : SDI DEC VCO

This submenu is used for an SDI input interface (SDI decoder).

Note

When select this submenu, mute the SDI input signal.

Description of video monitor



ex. A231 : SDI ENC VCO

① The adjustment mode (manual and automatic) or the messages during automatic adjustment are displayed in this line.

Manual :	Adjustment mode is set to the manual adjustment.
Auto (Push SET Button) :	Press the SET button to initiate the automatic adjustment.
Auto Adjusting ... :	Automatic adjustment is in progress.
Auto adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.

Note

The adjustment data can be manually changed even if message “Auto (Push SET Button)” is displayed.

② The adjustment item and adjustment data value are displayed in this line.

③ The VCO status is displayed as “0” or “1”.

Change of adjustment mode

The relation between the adjustment mode and display is shown in the table below.

Adj. mode	video monitor	FL display panel
Manual adjustment	Manual	MANUAL
Automatically adjustable	Auto (Push SET Button)	PUSH SET

(i) Turn the JOG dial upward and move the * mark to line ① on the video monitor. (On the FL display panel, “MANUAL” or “PUSH SET” is displayed.)

(ii) Press and turn the JOG dial.

Turn it downward. : Manual ⇨ Automatic

Turn it upward. : Manual ⇦ Automatic

To execute the automatic adjustment

(1) Display “Auto (Push SET Button)” on the video monitor and “PUSH SET” in the FL display panel referring to the “Change of adjustment mode” on page 3-64.

(2) The automatic adjustment is executed when the SET button is pressed.
- The display on the video monitor changes to “Auto Adjusting...”. The displayed data value also changes.
  The display in the FL display panel does not change.

(3) Check to see that the automatic adjustment completion and VCO status on the video monitor.
- Message “Auto Adjust Complete” is displayed when the automatic adjustment is completed.

Note

A slight time difference may occur from when message “Auto Adjust Complete” is displayed until the VCO status is displayed as “1”.

Note

Refer to the “For Automatic Adjustment Failure” below when message “Auto Adjust Failure” is displayed.

(4) To terminate the menu, press the MENU button.
To execute the automatic adjustment again in this menu, return to step (2).

(5) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A2F : NV-RAM CONTROL menu.
To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu.

For automatic adjustment failure

It can suppose that there is something wrong with the SDI-23 board.

Caution during manual adjustment

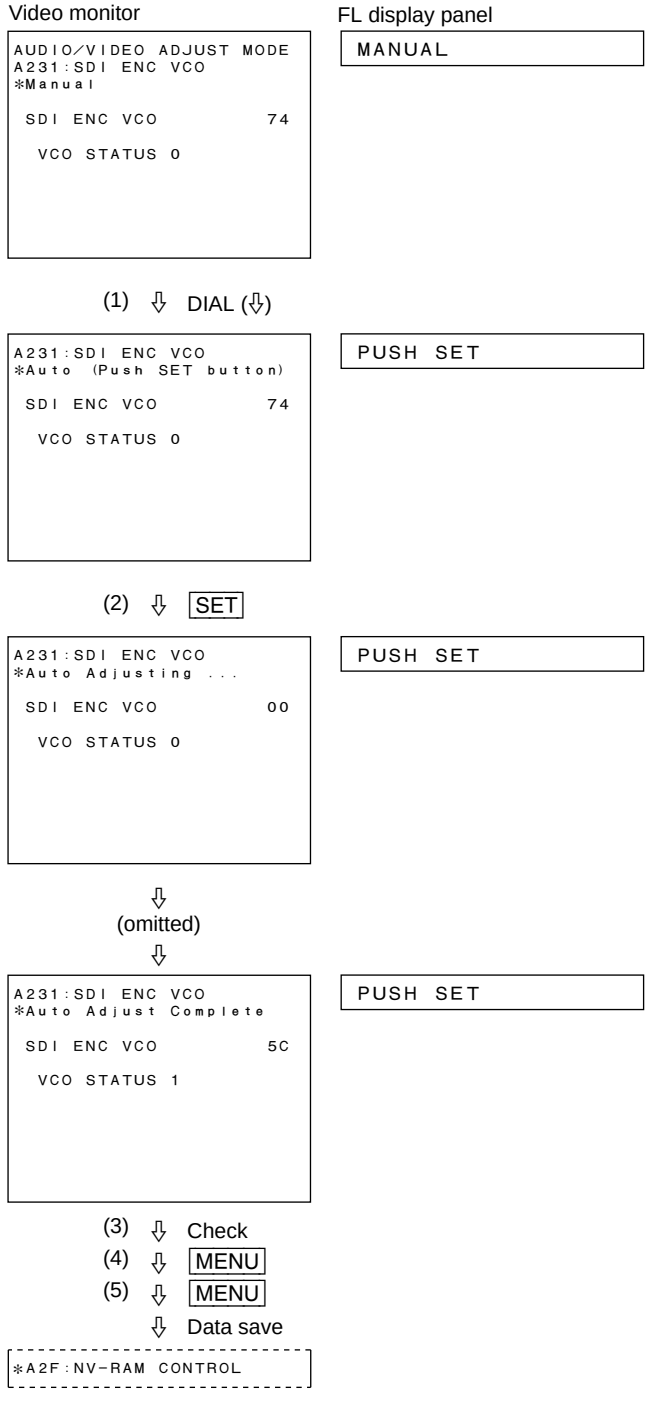
When performing the manual adjustment, set the adjustment data to 27.0 ± 0.1 MHz at TP700 on the SDI-23 board (for A231 : SDI ENC VCO) or at TP200 on the SDI-23 board (for A232: SDI DEC VCO) using the frequency counter.

Note

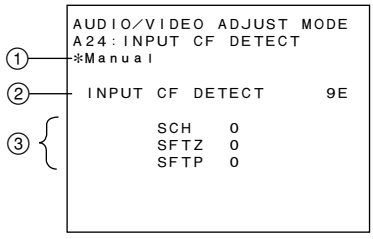
For the manual adjustment, refer to the “To change the adjustment data manually” on page 3-62.

Examples of display and operation

Examples of A231 : SDI ENC VCO



A24 : INPUT CF DETECT



This menu is used to adjust the color frame detection timing of a composite video input signal.
Preparation (refer to Section 9) is required for the adjustment.

Note

This adjustment is necessary to perform both 525/60 and 625/50 systems. (As for the 525/625 system switching, refer to Section 1-19-3.)

Description of video monitor

① The adjustment mode (manual and automatic adjustments) or the messages during automatic adjustment are displayed in this line.

Manual :	Adjustment mode is set to the manual adjustment.
Auto (Push SET Button) :	Press the SET button to initiate the automatic adjustment.
Auto Adjusting ... :	Automatic adjustment is in progress.
Auto adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.

Note

The adjustment data can be manually changed even if message “Auto (Push SET Button)” is displayed.

② The adjustment item and adjustment data value are displayed in this line.

③ Each status is displayed as “0” or “1”.
0: When the specification is not satisfied
1: When the specification is satisfied
(For SFTP, the status is displayed in alternate “0” and “1” when the specification is satisfied.)

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Change of adjustment mode

The relation between the adjustment mode and display is shown in the table below.

Adj. mode	video monitor	FL display panel
Manual adjustment	Manual	MANUAL
Automatically adjustable	Auto (Push SET Button)	PUSH SET

(i) Turn the JOG dial upward and move the ∗ mark to line ① on the video monitor. (On the FL display panel, "MANUAL" or "PUSH SET" is displayed.)

(ii) Press and turn the JOG dial.
Turn it downward. : Manual ⇨ Automatic
Turn it upward. : Manual ⇦ Automatic

To execute the automatic adjustment

(1) Display "Auto (Push SET Button)" on the video monitor and "PUSH SET" in the FL display panel referring to the "Change of adjustment mode" described above.

(2) The automatic adjustment is executed when the SET button is pressed.
- The display on the video monitor changes to "Auto Adjusting...". The displayed data value also changes. The display in the FL display panel does not change.

(3) Confirm the automatic adjustment completion and each status on the video monitor.
- Message "Auto Adjust Complete" is displayed when the automatic adjustment is completed. Status for SCH and SFTZ are displayed as "1". For SFTP is displayed in alternate "0" and "1".

Note

If the preparation for adjustment is not proper, message "Auto Adjust Failure" is displayed.

(4) To terminate the menu, press the MENU button. To execute the automatic adjustment again in this menu, return to step (2).

(5) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A2F : NV-RAM CONTROL menu.
To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu.

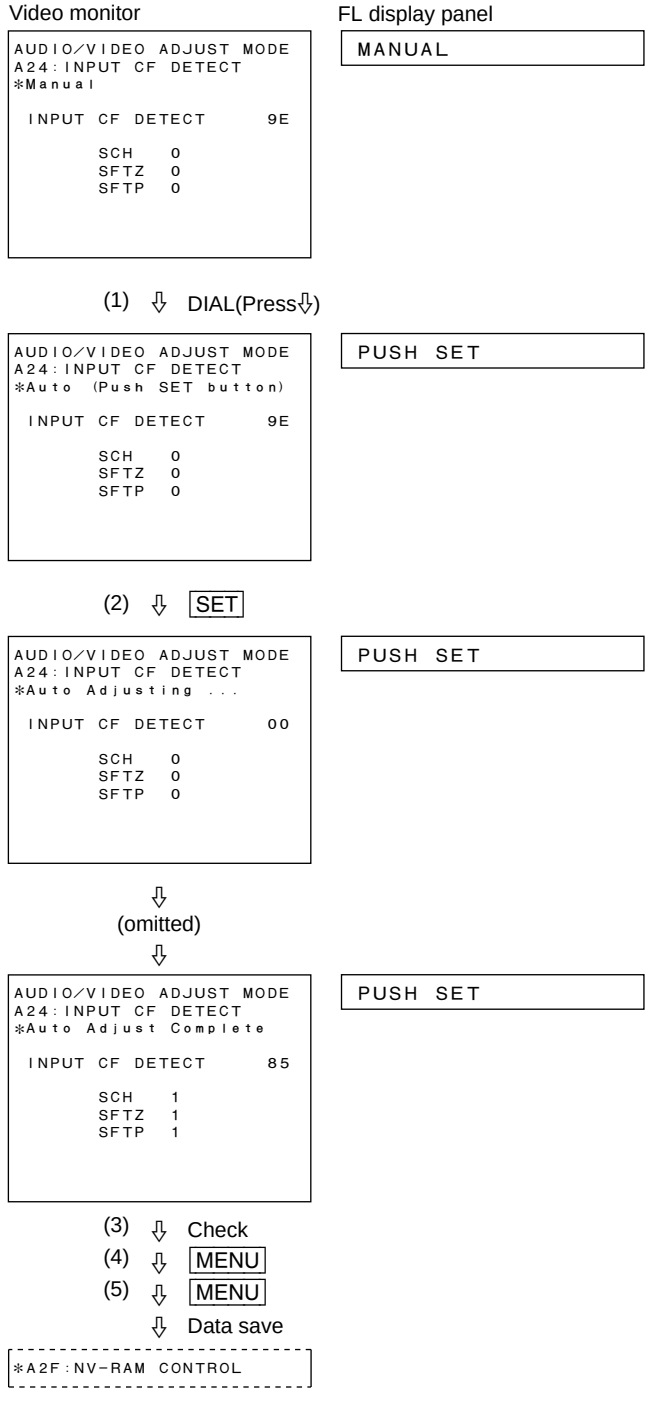
Caution during manual adjustment

When performing the manual adjustment, check the adjustment data range in which the SCH status is set to "1" and set the adjustment data to the intermediate value.

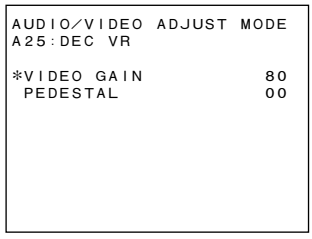
Note

For the manual adjustment, refer to the "To change the adjustment data manually" on page 3-62.

Examples of display and operation



A25 : DEC VR



This menu is used to adjust the composite video input system.

Note

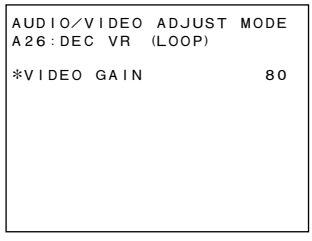
This adjustment is necessary to perform both 525/60 and 625/50 systems. (As for the 525/625 system switching refer to Section 1-19-3.)

Adjustment item	Description
VIDEO GAIN	Composite video input level
PEDESTAL	Composite video input pedestal clamp level

Note

The adjustment data in an A25 : DEC VR menu is used in common with the same adjustment item in an A26 : DEC VR (LOOP) menu.

A26 : DEC VR (LOOP)



This menu is used to adjust the composite video input system. The most suitable signal (refer to the table below) for adjustment is output from an internal video test signal generator, and the composite video input system can be adjusted with the multi-loop function activated.

Note

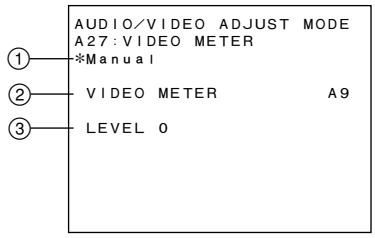
This adjustment is necessary to perform both 525/60 and 625/50 systems.

Adjustment item	Test signal
VIDEO GAIN	100% Color Bars

Note

The adjustment data in an A26 : DEC VR (LOOP) menu is used in common with the same adjustment item in an A25 : DEC VR menu.

A27 :VIDEO METER



This menu is used for the calibration of video meter on the FL display panel.
Before adjustment, inputs the reference video signal to the VIDEO INPUT connector on the connector panel, and set the unit into the EE mode.

Description of video monitor

① The adjustment mode (manual and automatic adjustments) or the messages during automatic adjustment are displayed in this line.

Manual :	Adjustment mode is set to the manual adjustment.
Auto (Push SET Button) :	Press the SET button to initiate the automatic adjustment.
Auto Adjusting ... :	Automatic adjustment is in progress.
Auto adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.

Note

The adjustment data can be manually changed even if message “Auto (Push SET Button)” is displayed.

② The adjustment item and adjustment data value are displayed in this line.

③ When the reference video signel is not input, the message “LEVEL 0” is displayed.

Change of adjustment mode

The relation between the adjustment mode and display is shown in the table below.

Adj. mode	video monitor	FL display panel
Manual adjustment	Manual	MANUAL
Automatically adjustable	Auto (Push SET Button)	PUSH SET

(i) Turn the JOG dial upward and move the ∗ mark to line ① on the video monitor. (On the FL display panel, "MANUAL" or "PUSH SET" is displayed.)

(ii) Press and turn the JOG dial.
Turn it downward. : Manual ⇨ Automatic
Turn it upward. : Manual ⇦ Automatic

To execute the automatic adjustment

(1) Display "Auto (Push SET Button)" on the video monitor and "PUSH SET" in the FL display panel referring to the "Change of adjustment mode" described above.

(2) The automatic adjustment is executed when the SET button is pressed.
- The display on the video monitor changes to "Auto Adjusting...". The displayed data value also changes. The display in the FL display panel does not change.

(3) Check to see that the automatic adjustment completion and each status on the video monitor.
- Message "Auto Adjust Complete" is displayed when the automatic adjustment is completed.

Note

If the preparation for adjustment is not proper, message "Auto Adjust Failure" is displayed.

(4) To terminate the menu, press the MENU button.
To execute the automatic adjustment again in this menu, return to step (2).

(5) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A2F : NV-RAM CONTROL menu.
To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu.

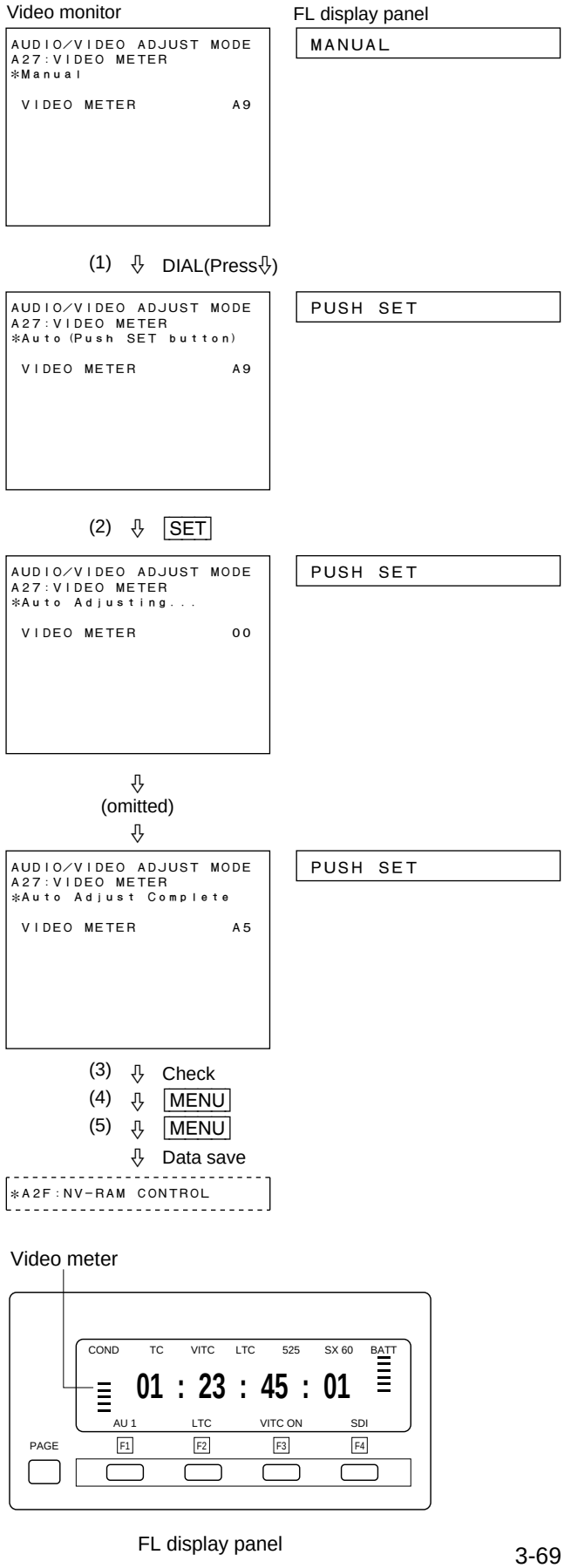
Caution during manual adjustment

When performing the manual adjustment, check the adjustment data range in which the display of video meter is set to the intermediate value (five lines).

Note

For the manual adjustment, refer to the "To change the adjustment data manually" on page 3-62.

Examples of display and operation



FL display panel

A2F : NV-RAM CONTROL

The A2F : NV-RAM CONTROL menu is used to save the audio/video adjustment data adjusted in the AUDIO/ VIDEO ADJUST mode in NV-RAM.
The current adjustment data can return to the state before adjustment when “ALL DATA PREVIOUS” is selected before the adjustment data is saved in the NV-RAM.

Note

When the adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

To execute the menu

(1) Turn the JOG dial and move the ∗ mark on the video monitor as described below.
To save the adjustment data after adjustment
⇨ “SAVE ALL ADJUST DATA”
To return to the adjustment data before adjustment
⇨ “ALL DATA PREVIOUS”
- In a FL display panel, “SAVE ALL ADJUST DATA” and “ALL DATA PREVIOUS” are displayed as messages “SAVE ALL ADJUST” and “ALL DATA PREVIOUS”, respectively.

(2) Push the SET button.
- The data transmission is initiated when the SET button is pushed.
- Message “Saving...” or “Loading...” is displayed on the video monitor, and message “SAVING” or “LOADING” is displayed in the FL display panel.

(3) Check to see that the data transmission is completed.
- After data transmission is completed, message “Save Complete” or “Load Complete” is displayed on the video monitor, and message “SAVE COMPLETE” or “LOAD COMPLETE” is displayed in the FL display panel.

(4) Push the MENU button to terminate the menu.

Examples of display and operation

(In data save)

Video monitor / FL display panel

```
AUDIO/VIDEO ADJUST MODE
 A2F:NV-RAM CONTROL

*NO OPERATION
 SAVE ALL ADJUST DATA
 ALL DATA PREVIOUS
```

NO OPERA TION

(1) ⇩ DIAL (⇩)

```
AUDIO/VIDEO ADJUST MODE
 A2F:NV-RAM CONTROL

 NO OPERATION
*SAVE ALL ADJUST DATA
 ALL DATA PREVIOUS
```

SAVE ALL ADJUST

(2) ⇩ [SET]

```
AUDIO/VIDEO ADJUST MODE
 A2F:NV-RAM CONTROL

 Saving ...
```

SAVING

⇩

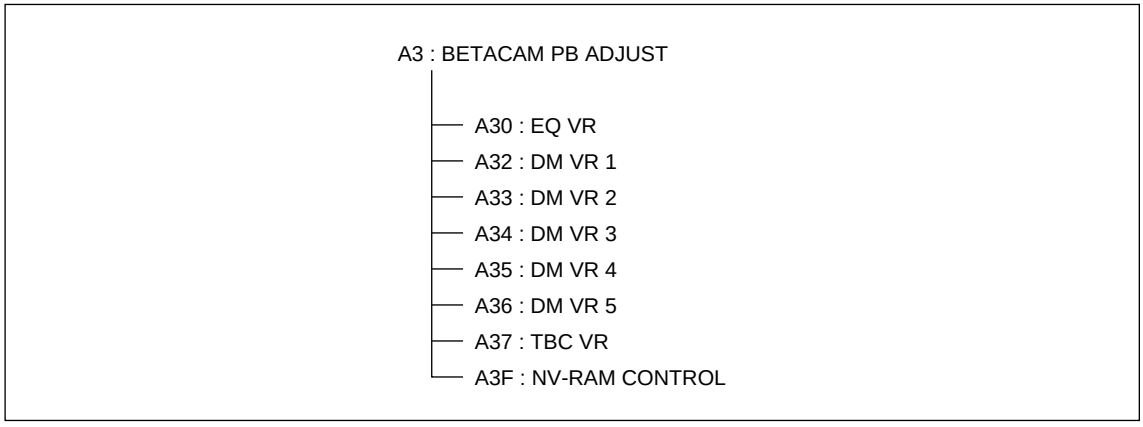
```
AUDIO/VIDEO ADJUST MODE
 A2F:NV-RAM CONTROL

 Save Complete
```

SAVE CO MPLETE

(3) ⇩ Check
(4) ⇩ [MENU]

3-2-9. BETACAM PB ADJUST Mode (A3)

The A3 : BETACAM PB ADJUST mode is used to adjust the PB system based on a Betacam/Betacam SP format.
This mode contains the eight menus below.



Menu Tree of BETACAM PB Adjustment Mode

CAUTION

Do not change the adjustment data carelessly. This may cause a trouble. For the actual adjustment, refer to the adjustment method described in the section 9.
If you have changed the adjustment data carelessly, execute ALL DATA PREVIOUS in an A3F : NV-RAM CONTROL menu or turn off the power of this unit without selecting an A3F : NV-RAM CONTROL menu.
Never execute SAVE ALL ADJUST DATA.

Note

Betacam/Betacam SP PB function of DNW-A28 is for NTSC (525/60) system.
Betacam/Betacam SP PB function of DNW-A28P is for PAL (625/50) system.
But the PB picture of the other video system is easily played back by selecting the setup menu.

To change the adjustment data manually

(1) Turn the JOG dial on the video monitor and move the ∗ mark to the adjustment item.
Turn the JOG dial in the FL display panel and display the item to be adjusted.
(2) Press and turn the JOG dial. The adjustment data then increases or decreases.

To return the adjustment data to the former state

Execute ALL DATA PREVIOUS in an A3F : NV-RAM CONTROL menu.

Note

The current adjustment data can not return to the former state after executing SAVE ALL DATA ADJUST DATA.

To save the adjustment data

Execute SAVE ALL ADJUST DATA in an A3F : NV-RAM CONTROL menu.

Note

In a FL display panel, the adjustment item name on the video monitor is omitted during display as follows :

RF GAIN ⇨ GAIN
GUARD BAND ⇨ GUARD
METAL ⇨ M
OXIDE ⇨ O

A30 : EQ VR

This menu is used to adjust the gain of the PB RF amplifier (EQ-72 board) based on a Betacam/Betacam SP format.
There are adjustment items for metal and oxide tapes. Each adjustment item is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

Example of display

```
BETACAM PB ADJUST MODE
A30:EQ VR

*RF GAIN METAL-Y-A    58
 RF GAIN METAL-Y-B    59
 RF GAIN METAL-C-A    48
 RF GAIN METAL-C-B    4D
 RF GAIN OXIDE-Y-A    72
 RF GAIN OXIDE-Y-B    75
 RF GAIN OXIDE-C-A    5A
 RF GAIN OXIDE-C-B    5C
```

A32 : DM VR 1

This menu is used to adjust the frequency characteristics of a primary cosine equalizer (DM-114/114P board).
There are adjustment items for metal and oxide tapes. Each adjustment item is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

Example of display

```
BETACAM PB ADJUST MODE
A32:DM VR 1

*EQ1 METAL-Y-A        7F
 EQ1 METAL-Y-B        81
 EQ1 METAL-C-A        77
 EQ1 METAL-C-B        81
 EQ1 OXIDE-Y-A        AD
 EQ1 OXIDE-Y-B        AF
 EQ1 OXIDE-C-A        94
 EQ1 OXIDE-C-B        9D
```

A33 : DM VR 2

This menu is used to adjust the frequency characteristics of a secondary cosine equalizer (main)(DM-114/114P board).
There are adjustment items for metal and oxide tapes. Each adjustment item is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

Example of display

```
BETACAM PB ADJUST MODE
A33:DM VR 2

*MAIN METAL-Y-A       BC
 MAIN METAL-Y-B       BC
 MAIN METAL-C-A       91
 MAIN METAL-C-B       91
 MAIN OXIDE-Y-A       A8
 MAIN OXIDE-Y-B       A8
 MAIN OXIDE-C-A       A0
 MAIN OXIDE-C-B       A0
```

A34 : DM VR 3

This menu is used to adjust the frequency characteristics of a secondary cosine equalizer (sub) (DM-114/114P board).
There are adjustment items for metal and oxide tapes. Each adjustment item is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

Example of display

```
BETACAM PB ADJUST MODE
A34:DM VR 3

*SUB METAL-Y-A        A4
 SUB METAL-Y-B        A4
 SUB METAL-C-A        70
 SUB METAL-C-B        70
 SUB OXIDE-Y-A        B6
 SUB OXIDE-Y-B        B6
 SUB OXIDE-C-A        AA
 SUB OXIDE-C-B        AA
```

A35 : DM VR 4

This menu is used to adjust the guard band width and to set the DC offset level of an over-modulation compensation circuit.
There are adjustment items for metal and oxide tapes. Each adjustment item is provided proportionally to the number of video channels (Y and C).

Example of display

```
BETACAM PB ADJUST MODE
A35:DM VR 4

*GUARD BAND METAL-Y   22
 GUARD BAND METAL-C   1A
 GUARD BAND OXIDE-Y   26
 GUARD BAND OXIDE-C   2F
 OMC DC METAL-Y       E4
 OMC DC METAL-C       D0
 OMC DC OXIDE-Y       D0
 OMC DC OXIDE-C       D0
```

A36 : DM VR 5

This menu is used to adjust the dropout threshold level and to set the RF envelope threshold level.
Metal and oxide tapes are used for the adjustment of a dropout threshold level. The adjustment item is provided proportionally to the number of video channels (Y and C).
Green /yellow (H) and yellow/red (L) limits are used for the setting of an RF envelope threshold level.

Example of display

```
BETACAM PB ADJUST MODE
A36:DM VR 5

*DO TH METAL-Y        1A
 DO TH METAL-C        12
 DO TH OXIDE-Y        2E
 DO TH OXIDE-C        27
 ENV-TH-H             20
 ENV-TH-L             10
```

A37 : TBC VR

This menu is used to set the read clock timing and the data of a PB VISC phase detection circuit on the DM-114/114P board.
The adjustment item is provided proportionally to the number of video channels (Y and C) for read clock timing setting.

Example of display

```
BETACAM PB ADJUST MODE
A37:TBC VR1

*SQ-Y RZ              4B
 SQ-C-RZ              6F
 VISC PHASE           06
```

A3F : NV-RAM CONTROL

The A3F : NV-RAM CONTROL menu is used to save the Betacam PB adjustment data adjusted in the BETACAM PB ADJUST mode in NV-RAM.
The current adjustment data can return to the state before adjustment when “ALL DATA PREVIOUS” is selected before the adjustment data is recorded in the NV-RAM.

Note

When the adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

To execute the menu

(1) Turn the JOG dial and move the ∗ mark on the video monitor as described below.
To save the adjustment data after adjustment
⇨ “SAVE ALL ADJUST DATA”
To return to the adjustment data before adjustment
⇨ “ALL DATA PREVIOUS”
- In a FL display panel, “SAVE ALL ADJUST DATA” and “ALL DATA PREVIOUS” are displayed as messages “SAVE ALL ADJUST” and “ALL DATA PREVIOUS”, respectively.

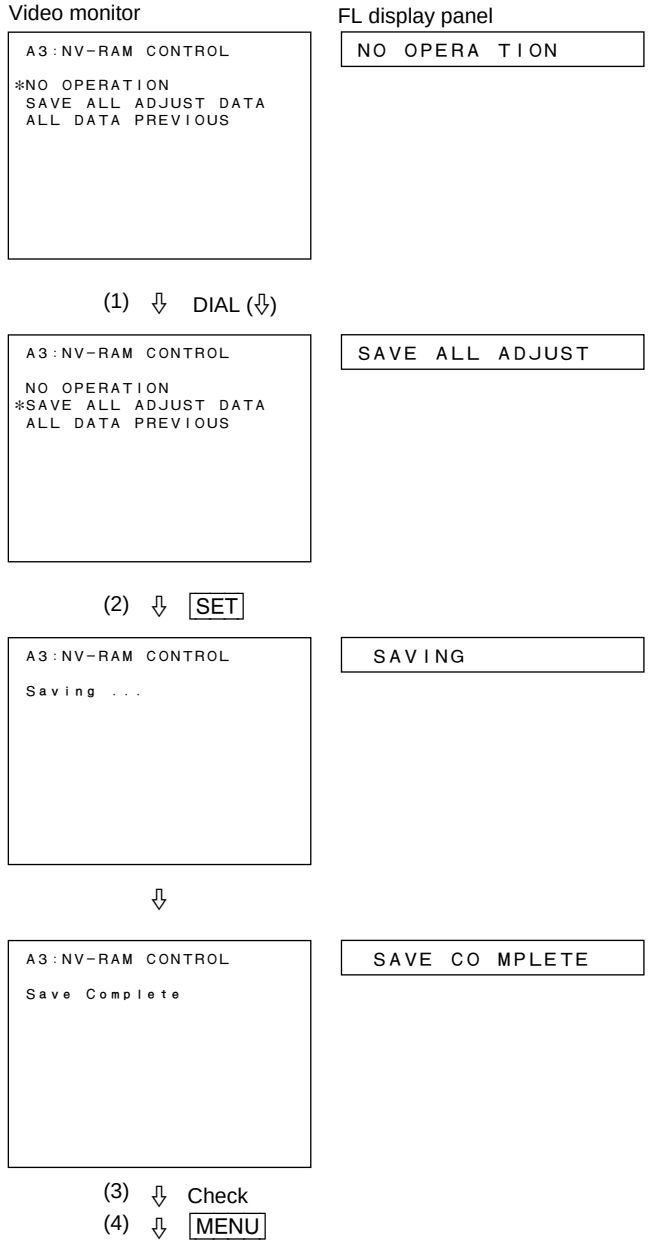
(2) Push the SET button.
- The data transmission is initiated when the SET button is pushed.
- Message “Saving...” or “Loading...” is displayed on the video monitor, and message “SAVING” or “LOADING” is displayed in the FL display panel.

(3) Confirm that the data transmission is completed.
- After data transmission is completed, message “Save Complete” or “Load Complete” is displayed on the video monitor, and message “SAVE COMPLETE” or “LOAD COMPLETE” is displayed in the FL display panel.

(4) Push the MENU button to terminate the menu.

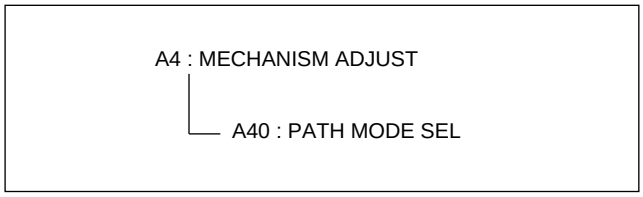
Examples of display and operation

(In data save)



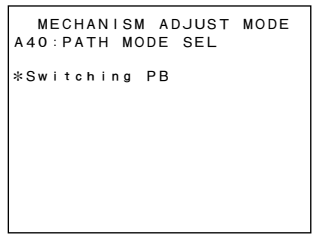
3-2-10. MECHANISM ADJUST Mode (A4)

The A4 : MECHANISM ADJUST mode is used to adjust the mechanism. This mode contains the one menu below.



Menu Tree of MECHANISM Adjustment Mode

A40 : PATH MODE SEL



This menu sets the PB mode for confirming and adjusting video tracking. Switching PB and full PB modes are available for setting.
A PB signal is output to the test point (TP101) on the SV-194A board by the REC head when the tape is played back with this menu opened. (The signal output from this test point becomes an envelope waveform.)
In the switching PB mode, only the data area (helical track) based on an SX format is played back.
In the full PB mode, the overlap portion before and behind the data area based on an SX format is played back.
The switching PB mode is always set when the menu is opened.

PB mode setting

To set the PB mode, press and turn the JOG dial, and display the desired setting.

Menu operation

A white square is displayed in the upper-right position of the superimpose picture when the SET button is pressed after the switching PB and full PB modes are set. The unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed.)
In this state, play back the specified alignment tape, and confirm and adjust the video tracking.
However, character information (time code or operation status) superimposed during ordinary operation is not displayed.
To return to the former state, press the MENU button.

Note

For the video tracking confirmation and adjustment, refer to “7-5. Video Tracking Confirmation and Adjustment”.

3-3. Error Logger Display Mode (M2)

3-3-1. Outline

This unit has an error log function that records the error generated or detected in this unit.
The error logger display mode is used to superimpose the contents (data) of the error log on the LCD monitor and video monitor. The ordinary display mode (refer to Section 3-3-2) and the setting mode (refer to Section 3-3-3) that displays the menu to limit the error log display are available in this unit.
The calendar/clock date incorporated into this unit can be set in the setting mode.

Activation and Termination

The two methods below are used to activate the error logger display mode. To terminate the error logger display mode, push the MENU button in the display mode. It returns to the operation state before activation when the error logger display mode is terminated.

A. Select an M2 : ERROR LOGGER menu in the maintenance mode.
B. Press the MENU button while pressing the SHIFT button on the front panel during ordinary operation.

Error Log

The recorded error log is classified into three categories: TAPE ERROR, WARNING, and CONDITION. (The error log belongs to the three types.)
Each log is constituted by a message, error generation date, and time code.
The message varies depending on the type of a log.
The error generation date is the date based on the calendar and clock of this unit. (The year is omitted.)
The time code records the time code data of the VTR side which is stored in this unit at the error occurs.
The maximum number of stored log is 100. If the number of log exceeds 100, the contents of oldest error log is erased sequentially.

TAPE ERROR

An error code and error message are recorded as a message when the error (error codes 01 to 99) related to a VTR and system occurs.
When multiple sub-error messages are displayed, the three sub-error messages from the top are recorded.
For the error message, refer to Section 2.

WARNING

The warning log below is recorded in an error log.

- REFERENCE MISSING
  This message is recorded when no signal is input to the REF VIDEO (reference video signal) connector after the power is turned on. But, this message is not recorded in the error log when the setting of 105 : REF SYSTEM ALARM in a setup menu to OFF.

CONDITION

The condition logs below are recorded in an error log.

- VIDEO PB CONDITION RED
  This message is recorded when the channel condition becomes red during video PB operation.
- AUDIO PB CONDITION RED
  This message is recorded when the channel condition becomes red during audio PB operation.

http://getMANUAL.com

3-3-2. Display Mode

The operation in the ordinary display mode is described based on a display example on the video monitor.
The log number/total log count is displayed in the second line. "(001/000)" is displayed when no log exists.
The third to tenth lines (eight lines) are the area where logs are displayed. The three-digit number on the left indicates the log number. The contents of a log are displayed on its right.
A calendar/clock is displayed on the lowest line.

Notes

- The top screen on the right is the example displayed when the error logger mode is first activated after the power is turned on. The second-time or later screen is displayed with the preceding display completed.
- In a FL display panel, only the log number/total log count (e.g., "ERR LOG 001/ 03") is displayed.

JOG dial

To display the log number not displayed on the screen, turn the JOG dial and move the ∗ mark.

CTL/TC/U-BIT button

On this screen, the whole message is displayed partially. To display other information (date and time code), push the CTL/TC/U-BIT button.

F FWD button

The whole contents of a log to which the ∗ mark was set are displayed while the F FWD button is pressed.
The category (error code for TAPE ERROR and DISK ERROR) of an error log is displayed in the third line. Messages are displayed in the fourth and fifth line
s, and sub-error messages in the sixth to eighth lines. The date (not including the year) is displayed in the ninth line, and time code in the tenth line.
Other logs can be displayed in this display state when the JOG dial is turned with the F FWD button pressed.

RESET button

The recorded all logs are erased when the RESET button is pushed.

Note

Usually, do not erase any log.
There may be some error logs that are useful for confirmation of the progress when a trouble occurs or that are important in preventing a trouble from occurrence.

Examples of display and operation

```
      ERROR LOGGER
        (001/003)
*001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR




   '99 07 03  09:23:00
```

⇩ DIAL (⇩)

```
      ERROR LOGGER
        (002/003)
 001 REEL TROUBLE-1
*002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
```

⇩ CTL/TC/UB

```
      ERROR LOGGER
        (002/003)
 001 01/01 13:12:56 REEL
*002 03/03 15:34:12 TAPE
 003 05/05 17:56:34 INTE
```

⇩ CTL/TC/UB

```
      ERROR LOGGER
        (002/003)
 001 00:01:02:03 REEL TR
*002 01:02:03:04 TAPE TE
 003 20:10:00:20 INTERNA
```

⇩ F FWD

```
      ERROR LOGGER
        (002/003)
        ERROR-06
   TAPE TENSION ERROR



 DATE  : 03/03 15:34:12
 TC    : 01:02:03:04

   '99 07 03  09:23:20
```

⇩ F FWD + DIAL (⇩)

```
      ERROR LOGGER
        (003/003)
        ERROR-92
   INTERNAL INTERFACE
         ERROR


 DATE  : 05/05 17:56:34
 TC    : 20:10:00:20

   '99 07 03  09:23:25
```

⇩

```
      ERROR LOGGER
        (003/003)
 001 00:01:02:03 REEL TR
 002 01:02:03:04 TAPE TE
*003 20:10:00:20 INTERNA
```

⇩ RESET

```
      ERROR LOGGER
        (001/000)
*




   '99 07 03  09:23:30
```

SET button

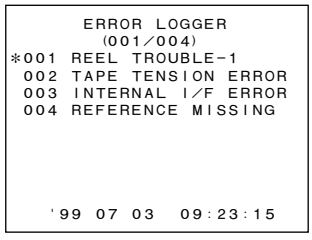
A white square mark is displayed in the upper-right position of the video monitor when the SET button is pushed. The unit then enters the normal operation state (in which the normal operation of this unit except a menu system can be performed). However, the character information (time code or operation status) superimposed during normal operation is not displayed in this case.
To return to the former state, push the MENU button.

MENU button

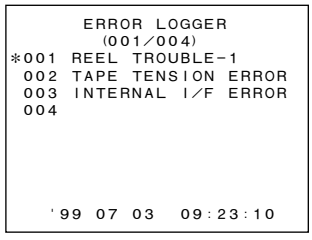
The display returns to the error logger display mode when the MENU button is pushed with the white square displayed in the upper-right position of the video monitor.
Pushing the MENU button in the error logger display mode terminates the error logger display mode.

Limited-display screen

For the error log of a category that is set to OFF in the menu of setting mode (refer to Section 3-3-3), information items other than a log number are not displayed. However, the whole display using the F FWD button is not influenced by the setting.

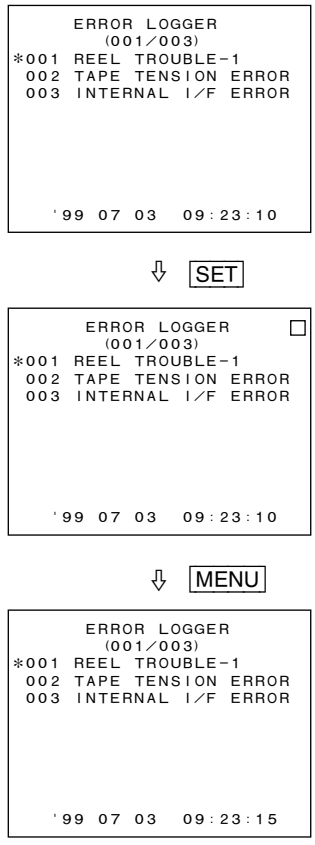


Ordinary Screen (No limited-display)



Only Warning Turned Off

Examples of display and operation



3-3-3. Setting Mode

The setting mode is used to display a menu that limits the display of an error log. In this menu, the display can be turned on and off for each error log category.
A calendar/clock can also be set in this menu.

Notes

- The top and second screens on the right are the examples displayed when the error logger mode and setting mode are first activated after the power is turned on. The second-time or later screen is displayed with the preceding display completed.
- A white square mark is displayed in the upper-right position of the LCD monitor as in the display mode when the SET button is pushed in the setting mode (except when "Push SET Button" is displayed during calendar/clock setting). The unit then enters the normal operation state (in which the normal operation of this unit except a menu system can be performed). The former state is returned when the MENU button is pushed.

Entering the setting mode

Push the SET button while pressing the STOP button in the display mode.

Returning to the display mode

Push the SET button again while pressing the STOP button or push the MENU button.

Setting menu

The seventh to tenth lines on the video monitor are a setting menu. The display in the display mode is left in the first to fifth lines.
Each setting when the power is turned on is all ON.
The error log belonging to a category is limited in display when each item is set to OFF. (Refer to the "Limited-display screen" on the previous page.)
The changed setting is valid until the power is turned off. How to change the setting is described below.

(1) Turn the JOG dial and move the ∗ mark to the category to be changed in setting.

Notes

- In a FL display panel, the contents of the ∗-marked line are displayed on the video monitor.
- Turn the JOG dial continuously downward for the calendar/clock setting. (Refer to the next page.)

(2) To change the setting from ON to OFF, press and turn the JOG dial upward. To change it from OFF to ON, press and turn the JOG dial downward.
(3) To change the setting of other categories, repeat steps (1) and (2).
(4) Push the MENU button to terminate the setting mode.

Example of display and operation

Display mode

```
      ERROR LOGGER
        (001/003)
*001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR




   '99 07 03  09:23:15
```

⇩ STOP + SET

Setting mode

```
      ERROR LOGGER
        (001/003)
 001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
*TAPE ERROR          ON
 WARNING             ON
 CONDITION           ON


   '99 07 03  09:23:17
```

⇩ DIAL(⇩)

```
      ERROR LOGGER
        (001/003)
 001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
 TAPE ERROR          ON
*WARNING             ON
 CONDITION           ON


   '99 07 03  09:23:20
```

⇩ DIAL(Press⇩)

```
      ERROR LOGGER
        (001/003)
 001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
 TAPE ERROR          ON
*WARNING             OFF
 CONDITION           ON


   '99 07 03  09:23:22
```

⇩ DIAL(Press⇩)

```
      ERROR LOGGER
        (001/003)
 001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
 TAPE ERROR          ON
*WARNING             ON
 CONDITION           ON


   '99 07 03  09:23:24
```

Calendar/clock setting

The calendar/clock's date and time of this unit can be adjusted in the setting mode as described below.

In a display/operation example on the right, 9:23 of July 3rd in 1999 is set to 15:00 of August 1st in 1999.

(1) Turn the JOG dial slowly and turn on and off the numerical value (year, month, day, hour, minute, or second) of the calendar/clock item to be changed.

Notes

- When a * mark is displayed in the setting menu, turn the JOG dial continuously downward until the numerical value blinks. For the calendar/clock setting, a * mark is not displayed on the video monitor.
- Do not turn the JOG dial excessively upward during setting. An ∗ mark is displayed in the setting menu and the calendar/clock setting is stopped.

(2) Press and turn the JOG dial, and change the numerical value to the desired one.

Notes

- The count display of seconds stops when the numerical value is changed. The internal data is updated.
- On the video monitor, message "Push SET Button" is displayed in the upper line.

(3) Repeat steps (1) and (2) until the numerical values in other items are changed completely.

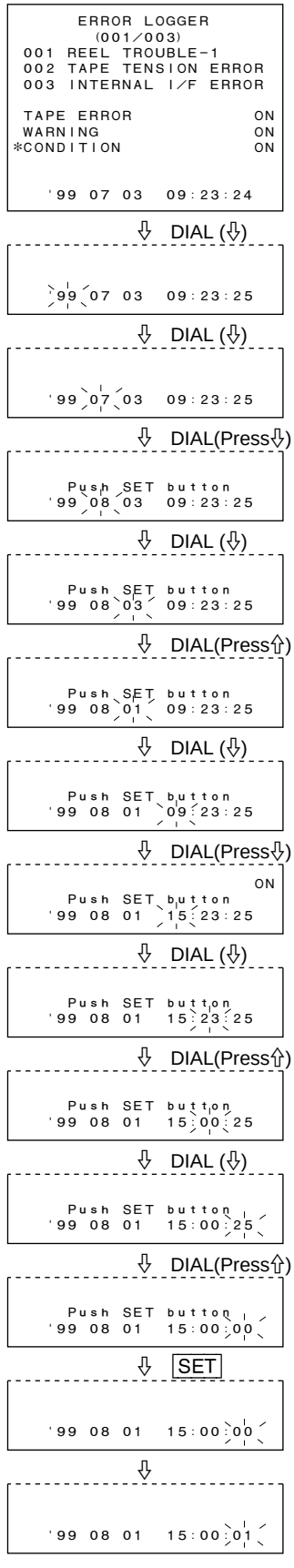
(4) Push the SET button to save the setting values.

Notes

- To change only the date, the time must also be set again.
- To cancel the calendar/clock setting, terminate the setting mode or turn the JOG dial upward until a ∗ mark is displayed in the setting menu (the setting menu item is displayed for a FL display panel).
- The unit enters the normal operation state when the SET button is pushed with message "Push SET Button" not displayed on the video monitor. Push the MENU button to return to the former state.
- To set the time accurately, push the SET button immediately the display and current time coincided.

(5) Push the MENU button to terminate the setting mode.

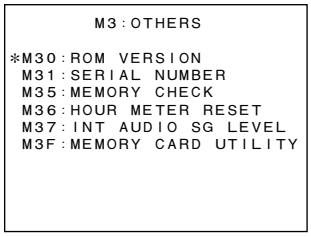
Example of display and operation



3-4. OTHERS CHECK Mode (M3)

3-4-1. Outline

The OTHERS check mode is used for other checks. This unit has the five menus and one submodes (M3F) below.



OTHERS CHECK mode

Title	Page	Description
M30 : ROM VERSION	3-82	Displays the unit's model name, ROM version, and optionally mounted board.
M31 : SERIAL NUMBER	3-82	Displays and corrects the serial number of this unit.
M35 : MEMORY CHECK	3-83	Displays the data in ROM. (Used for check at the factory.)
M36 : HOUR METER RESET	3-83	Displays and resets the resettable hours meter and thread counter.
M37 : INT AUDIO SG LEVEL	3-84	Sets the head room of an audio level meter.
M3F : MEMORY CARD UTILITY	—	Uploads and downloads the software using the memory card box.

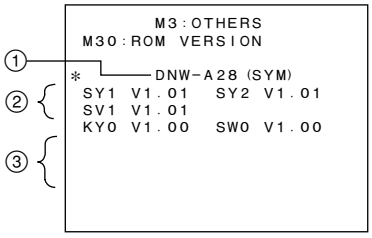
M3F : MEMORY CARD UTILITY

Note

M3F : MEMORY CARD UTILITY is not used currently.

3-4-2. ROM VERSION Display Menu (M30)

This menu displays the model name of this unit, the destination, the ROM version, and the information of the installed option.



Description of superimpose picture

① The model name of this unit and the destination in parentheses are displayed on the superimpose picture. The model name and destination are detected from the setting condition of the DIP switch (S202) on the SY-259B board.

② Each version number of system control ROMs (SY1 and SY2), a servo ROM (SV1), a front panel control ROM (KY0), and a switch control ROM (SW0) is displayed on the superimpose picture.

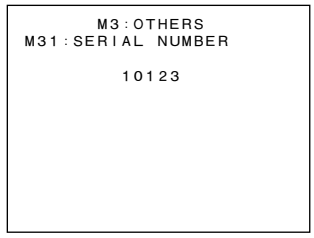
③ The installed options are displayed as described below when the option is installed.

Menu operation

Turn the search dial to move the ∗ mark.
The contents of an ∗-marked item on the superimpose picture are displayed in a FL display panel.
The installed option is displayed on only the superimpose picture.

3-4-3. SERIAL NUMBER Display Menu (M31)

This menu displays the serial number of this unit. When each serial number does not coincide because of repair, it can be set again in this menu.



Notes

- Set the serial number again after the SY-259B board or the NV-RAM (IC112 on the SY-259B board) is replaced.
- "−−−−−" is displayed in the state where no serial number is set.

Serial number setting

(1) Turn the JOG dial to turn on and off the digit you wish to set.
(2) Press and turn the JOG dial, and change the digit number.
  - Message "Push SET Button" is displayed on only the superimpose picture when the serial number is changed.
  - To cancel the setting, press the MENU button to terminate this menu.

(3) Repeat steps (1) and (2) for each digit.
(4) Press the SET button to save the set serial number.
  - Message "Saving..." is displayed on only the superimpose picture. If no abnormality is found, the display changes to "Save Complete" after a few seconds.

3-4-4. MEMORY CHECK Display Menu (M35)

This menu displays the ROM data installed in this unit in hexadecimal.

Note

This menu is used for inspection at the factory.

```
 M3:OTHERS
M35:MEMORY CHECK

0000*0000: 24 07 00 F0
0000 0004: 24 07 00 F0
0000 0008: 24 07 00 F0
0000 000C: 24 07 00 F0
0000 0010: 24 07 00 F0
0000 0014: 24 07 00 F0
0000 0018: 24 07 00 F0
0000 001C: 24 07 00 F0
0000 0020: 24 07 00 F0
```

Menu operation

When the JOG dial is turned, the first-digit value of the address changes with the ∗ mark moved to the position shown in the above figure. Press the JOG dial of the address and then turn it. The third digit of the address then changes.

The first and third digits alternately change every time the JOG dial is pressed. Turn the JOG dial with the STOP button pressed. The fifth-digit value of the address changes with the ∗ mark moved to the position shown in the figure below.

With the STOP button pressed, moreover, press the JOG dial and then turn it.

The seventh-digit value then changes. The first and seventh digits of the address alternately change every time the JOG dial is pressed with the STOP button pressed.

The contents of the ∗-marked line on the superimpose screen are displayed on the FL display panel.

Note

A white square is displayed in the upper-right position of the superimpose picture when the SET button is pressed. This unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed).

However, the character information (time code or operation status) superimposed during ordinary operation is not displayed.

To return to the former state, press the MENU button.

3-4-5. HOUR METER RESET Menu (M36)

This menu can display and reset the values of the resettable hours meter and thread counter.

```
       M3:OTHERS
 M36:HOUR METER RESET

*DRUM HOURS          234
 TAPE HOURS          123
 THREAD COUNTER     1234


 Push SET button
```

Description of superimpose picture

DRUM HOURS : Indicates the total of drum rotation time. Same as in setup menu ITEM-H12.

TAPE HOURS : Indicates the total of tape transport time. Same as in setup menu ITEM-H13.

THREAD COUNTERS : Indicates the total of threading count. Same as in setup menu ITEM-H14.

Menu operation

Turn the JOG dial to move the ∗ mark.

The contents of the *-marked line on the superimpose screen are displayed on the FL display panel.

To reset

The former state cannot be returned when the SET button is pressed for reset operation.

(1) Turn the JOG dial and move the ∗ mark to the item to be reset.

(2) Press and turn the JOG dial upward. The = display value then becomes zero (“0”).
- Message “Push SET Button” is displayed on only the superimpose picture when the display value is set to “0”.
- To return to the former state, turn the JOG dial downward.

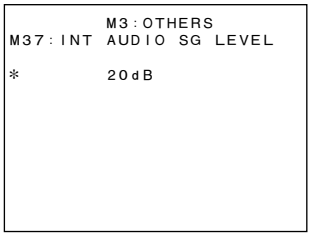
(3) If there are other items to be reset, repeat steps (1) and (2).

(4) Press the SET button to save the reset data.
- Message “Saving ...” is displayed on only the superimpose picture. If no abnormality is found, the display changes to “Save Complete” after a few seconds.

  To turn off “Save Complete”, turn the JOG dial.

3-4-6. INT AUDIO SG LEVEL

This menu can change the level of an internal audio SG.
The SG level can be selected from among the following. (The factor setting is 20 dB.)
20 dB, 18 dB, 16 dB, 15 dB, 14 dB, 12 dB, 9 dB



SG level setting

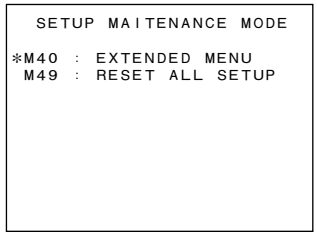
(1) Press and turn the JOG dial, and the desired setting is then displayed.
- Message “Push SET Button” is displayed on only the video monitor when the setting is changed.
- To cancel the setting, push the MENU button to terminate this menu.

(2) Push the SET button to save the changed setting.
- Message “Saving...” is displayed on only the video monitor. If no abnormality is found, the display changes to “Save Complete” after a few seconds.
  To turn off “Save Complete”, turn the JOG dial.

3-5. Setup Maintenance Mode (M4)

3-5-1. Outline

The setup maintenance mode is used for the setup menu.
This unit has two menus below.



Method to select M49: RESET ALL SETUP

(1) Turn the JOG dial while pressing the PLAY button and move the "*" mark.
(2) Press the SET button.

3-5-2. EXTENDED MENU Display Selection Menu (M40)

It is selected by switching the DIP switch S201-1 on the SY-259B board whether display the extended menus of the setup menu or not.
However, only when this switch is OFF (factory setting), the extended menus are enabled to display by this menu.

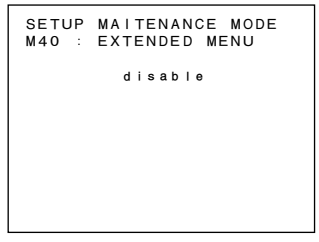
Note

When the setting of the DIP switch S201-1 is ON, the extended menus are enabled to display regardless of the setting in this menu.

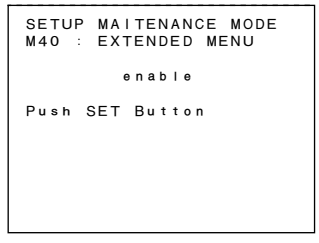
To execute

(1) Press and turn the JOG dial, display the desired setting.
disable: Not display the extended menu
enable: Display the extended menu
(2) Press the SET button.

Examples of display and operation



(1) ⇩ DIAL(Press⇩)



(2) ⇩ SET

3-5-3. RESET ALL SETUP Executing Menu (M49)

Reset the following settings to the factory setting at once.

- All “current” and “bank” in the setup menu
  For 525/60 system : current, bank1, bank2, bank3, bank4
  For 625/50 system : current, bank1, bank2, bank3, bank4
- ITEM-013 : 525/625 SYSTEM SELECT in the setup menu
- M40 : EXTENDED MENU in the maintenance mode

To execute

(1) Press and turn the JOG dial downward, and move the * mark to ON.
  - The message “All the System Setup data will be changed to Factory default.” is displayed on the video monitor.

(2) Press the SET button.
  - The message “Executing...” is displayed on the video monitor during changing the setting.

(3) Check that the setting change is completed.
  - After the setting change is completed, the message “Complete” “Turn off/on POWER!!” is displayed on the video monitor .

(4) Turn off the power.

(5) Turn on the power again.

Examples of display and operation

```
SETUP MAITENANCE MODE
M49 : RESET ALL SETUP

          *OFF
```

(1) ⇩ DIAL(Press⇩)

```
SETUP MAITENANCE MODE
M49 : RESET ALL SETUP

          *ON

Push SET Button


------ Caution ------
All the System Setup
data will be changed
to Factory default.
```

(2) ⇩ [SET]

```
SETUP MAITENANCE MODE
M49 : RESET ALL SETUP

          *ON

Executing...


------ Caution ------
All the System Setup
data will be changed
to Factory default.
```

(3) ⇩ Check

```
SETUP MAITENANCE MODE
M49 : RESET ALL SETUP

          *ON

Complete

 Turn off/on POWER!!
```

(4) ⇩ Turn OFF the power

(5) ⇩ Turn ON the power

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Section 4
Periodic Maintenance and Inspection

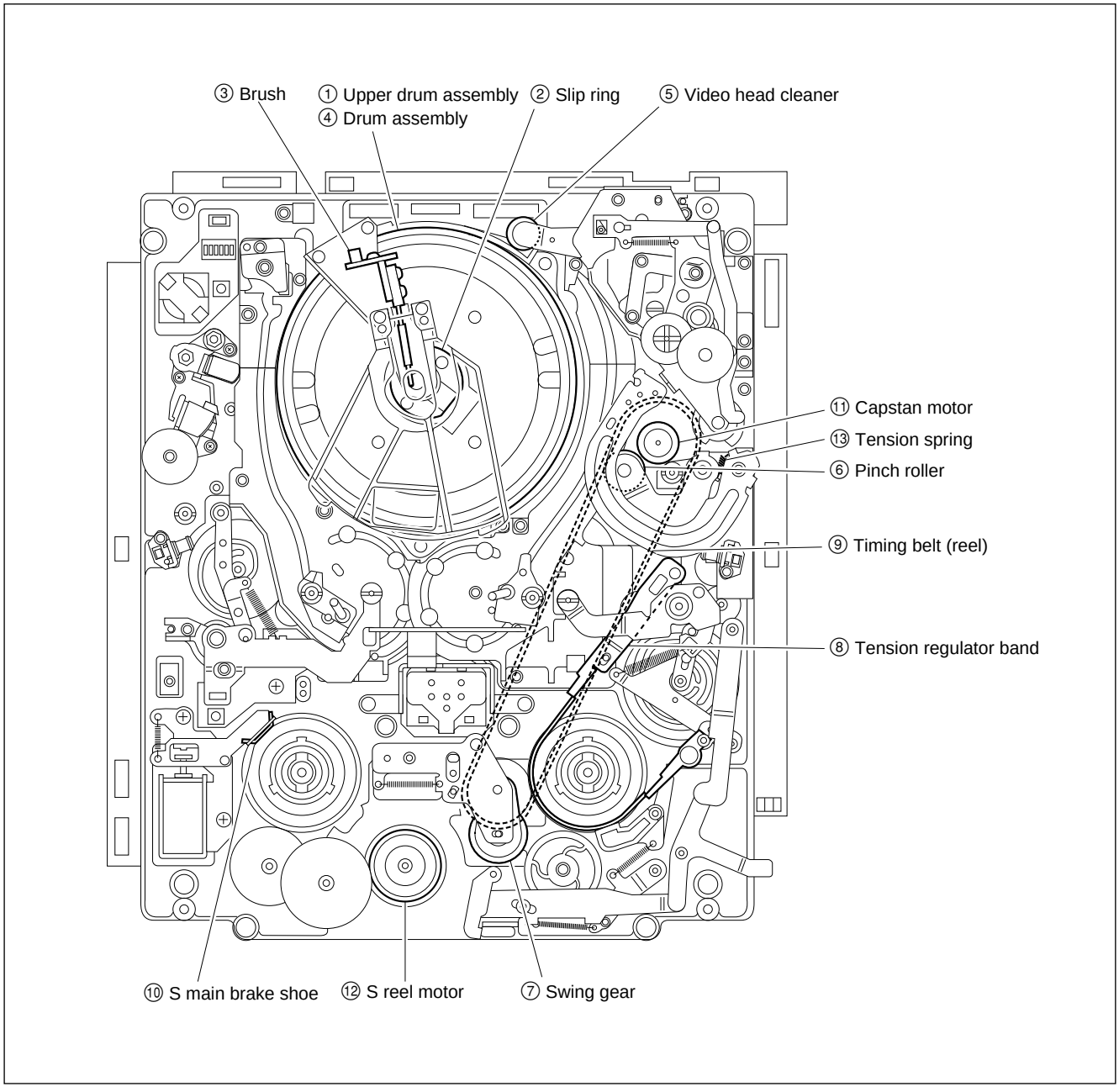
This section explains about periodic maintenance and how to clean.

4-1. Periodic Maintenance

To make the most of the functions, fully realize the performances of this unit and to lengthen the life of the unit, periodic check and parts replacement are recommended.

4-1-1. Index

It is necessary to check and replace periodically to the following parts.
The numbers in the illustration correspond to the table in the next page.



4-1-2. Periodic Replacement and Check Item Table

The replacement time shown in the following table is not the guarantee term of parts. The replacement time of parts varies depending on the operating environment and conditions of the unit.
Especially, the pinch roller and video head cleaner may be required replacing earlier than replacement period shown in table depending on their dirt or abrasion.
The part with arrow "↓" in the table is included in the part pointed by the arrow.
When the part pointed by the arrow is to be replaced, the part with the arrow will be replaced at the same time.

R : Replacement

No.	Replacement Part	Mode	Inspection hours 1,000	2,000	3,000	4,000	5,000	6,000	Part No.	Description
①	Upper drum assembly	A		R		↓		R	A-8317-461-A	Upper drum assembly DJR-20A-R
②	Slip ring	A		R		↓		R	A-8317-463-A	Slip ring assembly, 4ch (RP)
③	Brush	A		R		↓		R	A-8317-464-A	Brush assembly, 4ch (RP)
④	Drum	A				R			A-8317-459-A	Drum assembly DJH-20A-R
⑤	Video head cleaner	B	R	R	R	R	R	R	X-3949-109-1	AHC roller assembly
									3-615-320-01	CR cap
⑥	Pinch roller	B	R	R	R	R	R	R	X-3678-926-1	Pinch Roller
⑦	Swing gear	B		R		R		R	A-8278-829-C	Gear assembly
⑧	Tension regulator band	B		R		R		R	A-8278-704-C	Tension regulator band assembly
⑨	Timing belt (reel)	B			R			R	3-611-544-01	Timing belt
⑩	S main brake shoe	B			R			R	3-611-473-01	Brake shoe
⑪	Capstan motor	B						R	8-835-590-01	DC motor SCV-0703A/J-N
⑫	S reel motor	B						R	8-835-589-01	DC motor SRV11A/J-N
⑬	Tension spring	C	Replace every 20,000 times.						3-613-709-01	Tension spring

Mode A : Drum rotating hours (hours)
Mode B : Tape running hours (hours)
Mode C : Threading counter (times)

4-1-3. Hours Meter

This unit can display an hours meter on the FL display panel. Indication of the hours meter can be displayed on the video monitor if it is connected to the VIDEO OUTPUT 2 (SUPER) connector. Perform a periodic check with this hours meter as a reference.

1. Contents of display

Menu No.	Display	Contents
H01	OPERATION HOURS	Sum of energized time
H02	DRUM RUNNING HOURS	Sum of drum rotating time
H03	TAPE RUNNING HOURS	Sum of tape running time
H04	THREADING COUNTER	Sum of threading
H12	DRUM RUNNING HOURS	Sum of drum rotating time (Resettable)
H13	TAPE RUNNING HOURS	Sum of tape running time (Resettable)
H14	THREADING COUNTER	Sum of threading (Resettable)

2. Display procedures

(1) Press the MENU button of the front panel to display the menus and their contents.
(2) Press the MENU button again to exit the MENU.

3. How to reset

Refer to Section 3-4-6 in “Section 3 Maintenance Mode” to reset the resettable menus (H12, H13, and H14).

4-2. Cleaning

To make the most of the functions, fully realize the performance of this unit, and to lengthen the life of the unit and tape, clean the components often.

4-2-1. Using Cleaning Tape

If the video heads are clogged, clean the video head by the following procedure.
Make sure to use the specified cleaning tape. If other tape is used, unusual abrasion or damage of the video heads may occur.

Specified cleaning tape: BCT-5CLN

Procedure

1. Insert the Cleaning tape BCT-5CLN to the unit.
2. Press the EJECT and PLAY buttons simultaneously.
   The cleaning tape is played back for approx. five seconds. After that, the cleaning tape will be ejected automatically.

   Notes

   - If the cleaning tape is not ejected after playing back more than five seconds, be sure to press the EJECT button immediately and eject the cleaning tape.
   - Do not be place the cleaning tape in the STOP mode, and do not put the unit in fast-forward and rewind mode, because the video heads may be damaged.
3. Check that the head clogging is clear.

If the video heads are still clogged after cleaning by cleaning tape, clean them with cleaning cloth. (Refer to Section 4-2-3.)

4-2-2. General Information for the Use of Cleaning Cloth

1. Cautions

- Be sure turn the power off before cleaning.
- Each block in the mechanical deck consists of a precision part and is adjusted precisely. Be careful not to damage each part and to apply an excessive force during cleaning.
- Do not touch the greased portions during cleaning. If grease attaches to cleaning cloth, replace the cleaning cloth with a new one. If a cleaning cloth smeared with grease is used, grease may attach to the places where it should not.
- Do not insert a cassette tape before a cleaning fluid completely evaporates after cleaning.

2. Preparation

(1) Turn the power off.
(2) Remove the top plate. (Refer to Section 1-4-1.)
(3) Remove the cassette compartment. (Refer to Section 1-5.)

4-2-3. Cleaning of Video Heads and Tape Running Surface of Upper Drum

Cautions

- Never contact the drum during rotating.
- The video heads can be damaged easily. Be careful not to damage the video heads during cleaning.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Note

Never use a cotton swab to clean the video heads.

Procedures

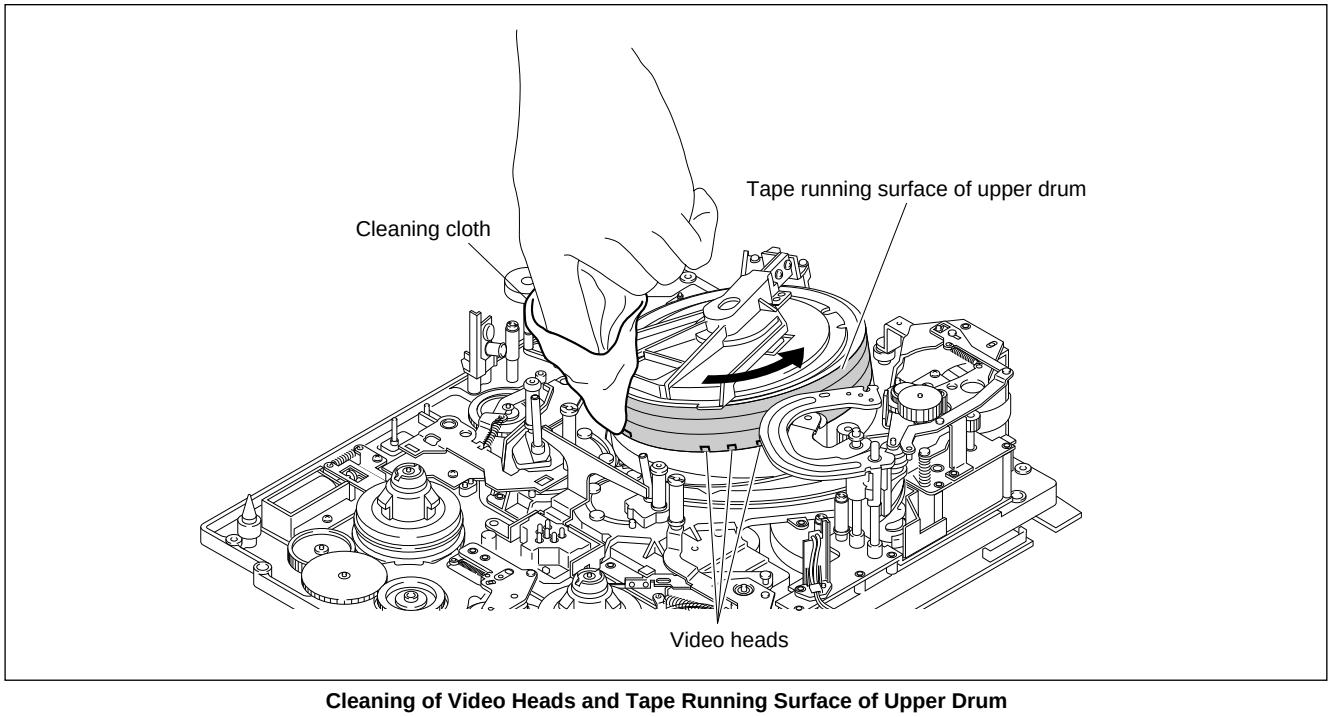
1. Hold the cleaning cloth moistened with a cleaning fluid keeping it without becoming wrinkled. And then, press the cleaning cloth slightly against the video heads.

2. Slowly rotate the upper drum counterclockwise two or three turns to clean the tape running surface and video heads (shaded portion in the figure).

   Note

   Be sure to rotate the upper drum counterclockwise and clean the video heads along the circumference. Do not rotate the upper drum in the opposite direction (clockwise) or clean it in the vertical direction. This may damage the brush and slip ring or the video heads.

3. After cleaning, wipe it with a dry cleaning cloth two or three times.



Cleaning of Video Heads and Tape Running Surface of Upper Drum

4-2-4. Cleaning of Lead Surface and Tape Running Surface of Lower Drum

Caution

Be careful not to damage the lower drum (especially lead surface) during cleaning. Pay careful attention to the upper edge portion of the lower drum because it is located near the video heads.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Skewer or an equivalent (Never use a metallic skewer.)

Procedures

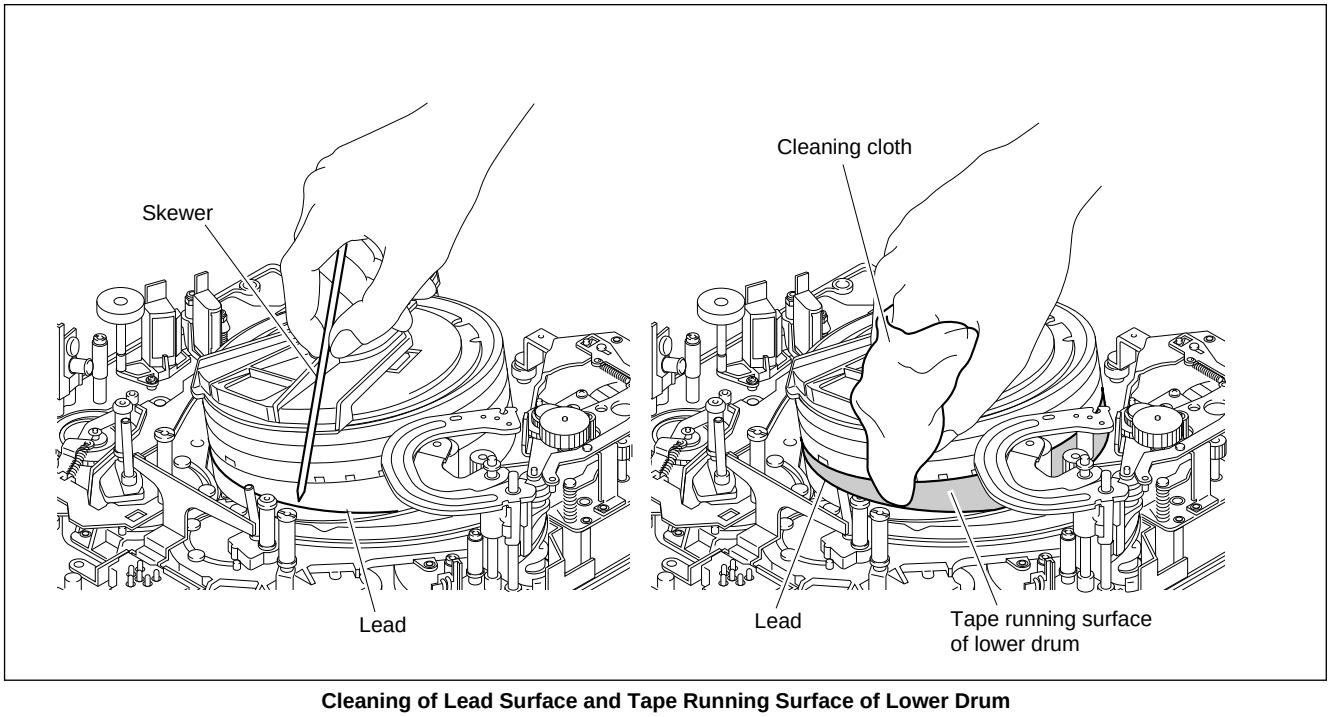
1. As shown in the figure, put a skewer (or an equivalent) along the drum lead surface and remove the magnetic powder.

   Notes

   - Never use a metallic skewer instead of the skewer to avoid damage the tape running surface.
   - Tracking may be badly influenced if magnetic powder attaches to the drum lead surface. Remove the magnetic powder completely during cleaning.

2. Wipe the drum lead surface and lower drum's tape running surface (shaded portion in the figure) with a cleaning cloth moistened with a cleaning fluid.

3. After cleaning, wipe it with a dry cleaning cloth two or three times.



Cleaning of Lead Surface and Tape Running Surface of Lower Drum

4-2-5. Stationary Heads and Tape Cleaner Cleaning

Cautions

- Do not contact the edge with bare hands because the tape cleaner has sharp edge. Pay careful attention to the tape cleaner during cleaning.
- Being careful not to damage the head surface, clean the stationary heads.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

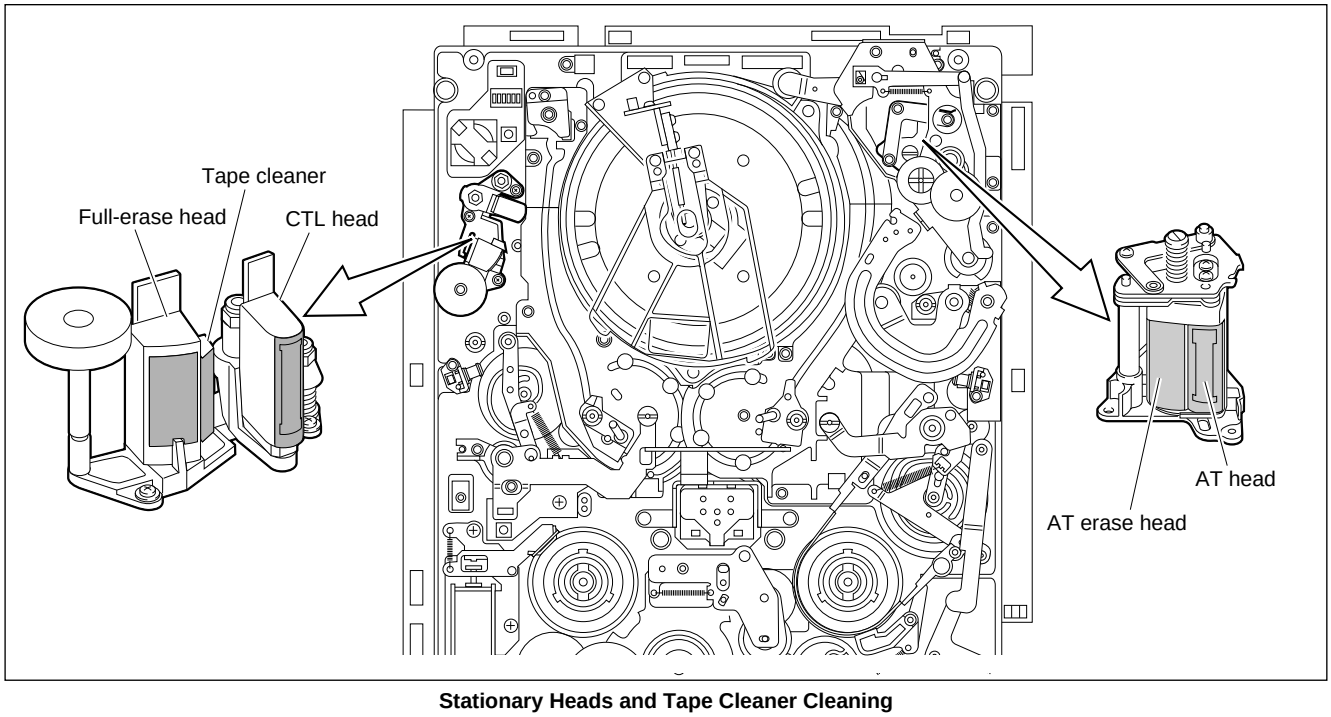
Procedures

1. Wipe the tape running surfaces (shaded portion in the figure) of the full-erase head, tape cleaner, CTL head, AT erase head and AT head in the vertical direction with a cleaning cloth moistened with a cleaning fluid.

   Notes

   - Remove the magnetic powder completely during cleaning. An error may occur in the playback or recording when magnetic powder attaches to the head gap portion of the full-erase head, CTL head, AT erase head or AT head.
   - Do not contact the edge portion of the tape cleaner with bare hands.
   - Do not apply an excessive force to the tape cleaner to avoid damage it.

2. After cleaning, wipe them with a dry cleaning cloth two or three times.



Stationary Heads and Tape Cleaner Cleaning

4-2-6. Tape Running System Cleaning

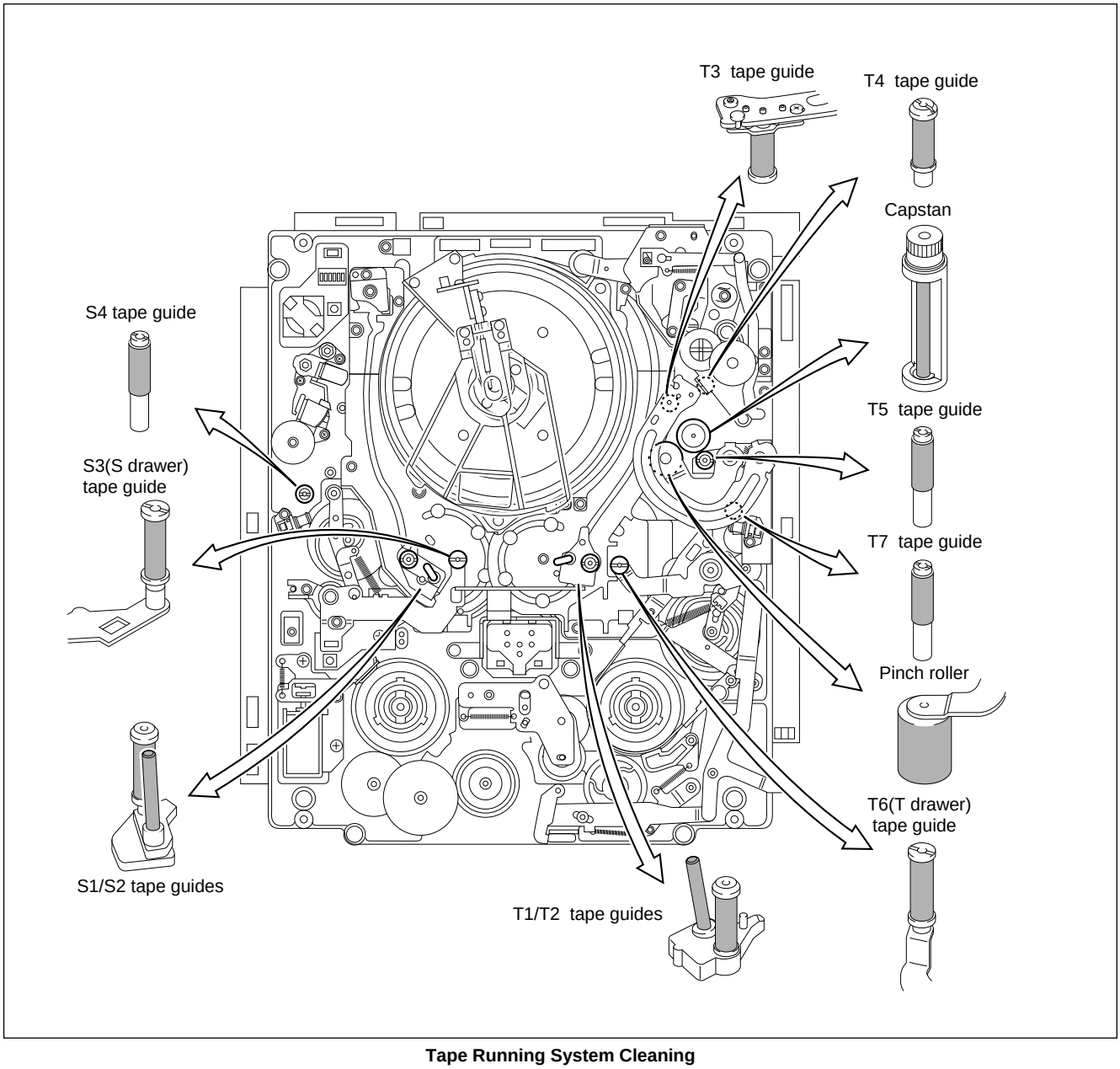
Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Procedures

1. Wipe the tape running surfaces (shaded portions in the figure) of each guide with a cleaning cloth moistened with a cleaning fluid.

2. After cleaning, wipe them with a dry cleaning cloth two or three times.



Tape Running System Cleaning

4-3. Video Head Tip Protrusion Check

When performing the periodic maintenance or inspection, measure the tip protrusion of the video heads using a head tip protrusion measurement gauge to check them for the upper drum assembly replacement.

If the tip protrusion of all heads are satisfying the following specification and more, it enables to recording and playing back on the tape.

Head	Specification
PB heads for Betacam/Betacam SP format	20 µm
PB heads for BetacamSX format	
REC heads for BetacamSX format	

If the tip protursion of any one head is under the specification, it is recommended that the upper drum assembly should be replaced early before occurring the trouble at the recording or playing back.
As for the upper drum replacement, refer to Section 5-2.

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-537-01
- Head tip protrusion measurement gauge: J-6530-650-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver's bit (for M2) : J-6325-380-A

4-3-1. Head Tip Protrusion Measurement

Preparations for VTR

1. Remove the top plate. (Refer to Section 1-4-1.)
2. Remove the cassette compatment. (Refer to Section 1-5.)
3. Remove the drum cover. (Refer to Section 5-3.)
4. Clean the outer circumference and video heads of the upper drum (shaded portions in Figure 1). (Refer to Section 4-2-3 for the cleaning method.)

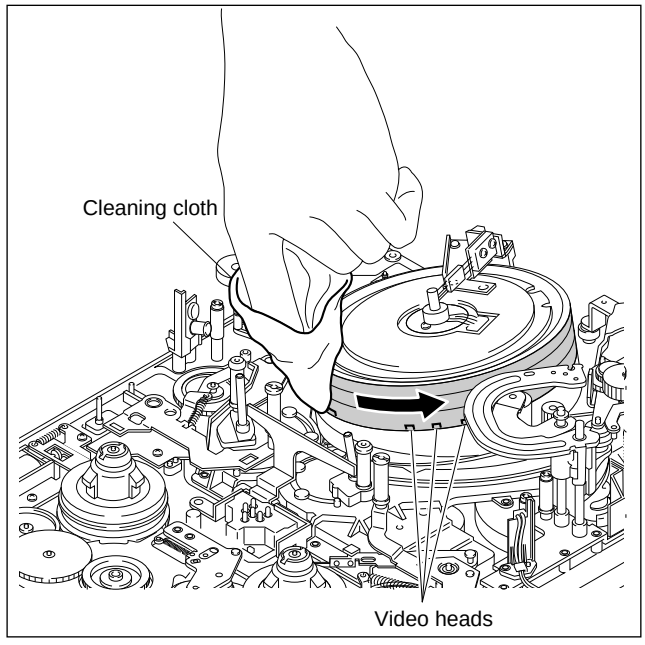


Figure 1. Cleaning of Drum

Preparations for Head Tip Protrusion Measurement Gauge

This gauge is the precision equipment. Handle with care.

1. Loosen the adjustment screw fully by turning it counterclockwise. (Refer to Figure 3.)
2. Clean the probe, positioning flange, and portion contacting the drum of two legs. (Refer to Figure 3.)

Note

Do not apply an excessive force to the probe during cleaning. If a deposit of µm order exists, measurement cannot be performed accurately.

Setting of Head Tip Protrusion Measurement Gauge

Note

Being careful not to damage the tape-running surface and video heads of the drum, set the gauge.

1. While pushing the manual eject knob downward, turn it clockwise to set the unit in threading-end condition.
   Note
   Make sure that the T drawer arm hits the stopper at this time.
2. Rotate the upper drum manually counterclockwise (↺) to align the label of the board cover with the frame of the brush assembly.

Note

The upper drum position is determined as described above to put the probe of the head tip protrusion measurement gauge on the absence of a head. The video head that first measures the protrusion value is the CNF A head.

3. Check the value that the dial gauge pointer reads.
4. Position a probe between the dummy head and CNF A head. (Refer to Figure 2.)
5. Press the tip of two legs against the outer circumference of the drum's upper surface while keeping the base plate of the measurement gauge in parallel with the upper surface of the drum. Be sure to keep the probe of the measurement gauge sufficiently away from the drum.
6. Lower the measurement gauge slowly until the ridges of the two legs and positioning flange touch the upper drum while pushing two legs against the outer circumference of the drum's upper surface (applying force slightly to the measurement gauge in the direction indicated by the arrow). (Refer to Figure 3.)
   Notes
   - Before placing a measurement gauge on the drum, ensure that the adjustment screw has been loosened fully.
   - Perform carefully and slowly so that the probe of a measurement gauge does not touch the outer circumference or video head on the drum.
     (Lower so that the probe is slightly higher than the two legs.)
   - After placing the measurement gauge on the drum, be sure to support it with hand at all times.
     If it is loose carelessly, the drum and measurement gauge will turn and damage the peripheral parts.

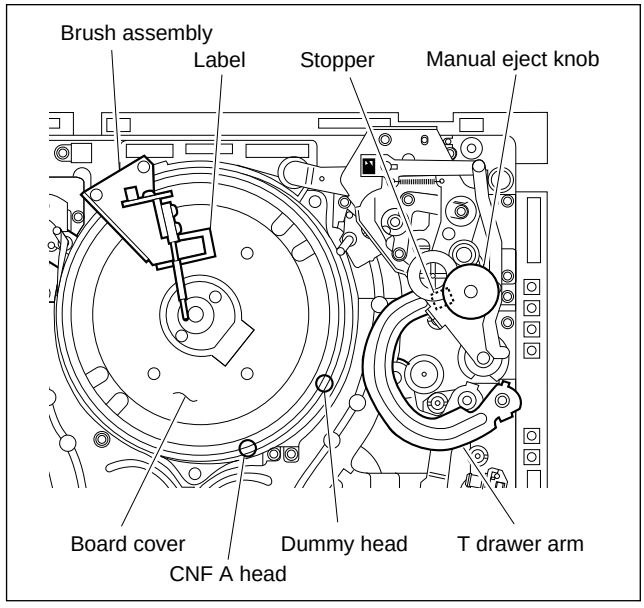


Figure 2. Alighment of Drum Position

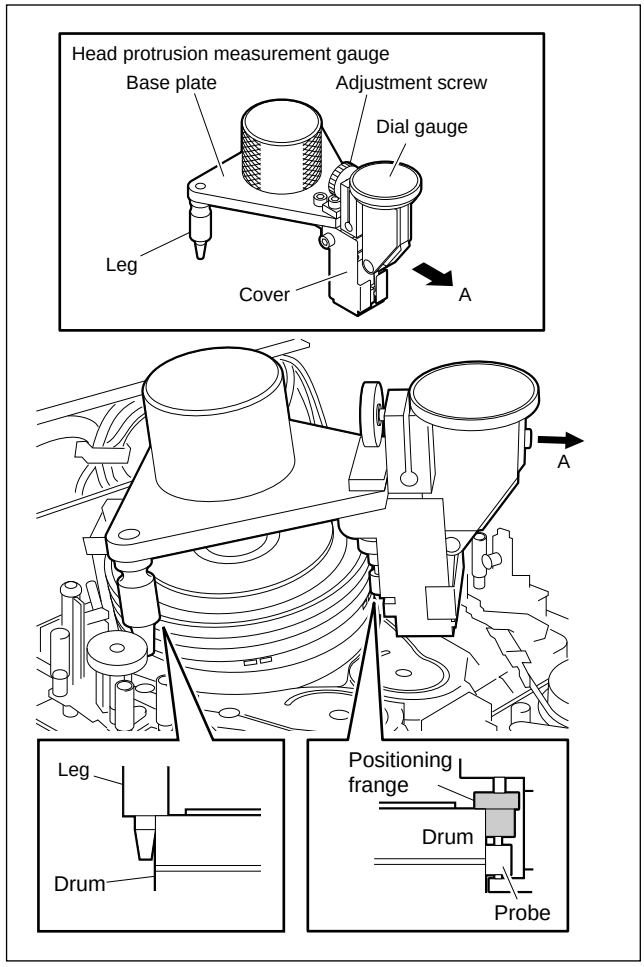


Figure 3. Setting of Head Tip Protrusion Measurement Gauge

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7. Check to see the followings:
   - The probe is in the middle of the adjacent heads.
   - The positioning flange adheres closely to the outer circumference of the drum's upper surface.
   - The legs adhere closely to the outer circumference of the drum's upper surface.
   - The value that the dial gauge pointer reads is the same as before setting (in step 2).
8. Turn the adjustment screw clockwise until the dial gauge pointer rotates approximately a half turn.
9. Turn the outer frame of the dial gauge to align zero (0) to the pointer.

Measurement of Head Tip Protrusion

Note

When rotating the upper drum manually, hold the cover of the measurement gauge by your hand to not come to turn the gauge with the drum rotation.

1. Rotate the upper drum manually counterclockwise (↺) very slowly to approach a video head aside of the probe. (Refer to <A> in Figure 4.)
2. Read the dial gauge pointer. (= Ha)

   Note

   The scale of the dial gauge is 2 µm (0.002 mm) pitch. Clockwise: +. Counterclockwise: −.
3. Rotate the upper drum manually counterclockwise (↺) very slowly to center the video head in the probe. (Refer to <B> in Figure 4.)
4. Read the dial gauge pointer. (= Hb)
5. Calculate the real head tip protrusion Hr with the Ha and Hb.

   Hr = Hb − Ha
6. Calculate the head tip protrusion Hr for all heads with steps 1 through 5 performing .
7. Measure and calculate the real head tip protrusion Hr for all heads again.

   Note

   Do it two times for fear of measuring error.

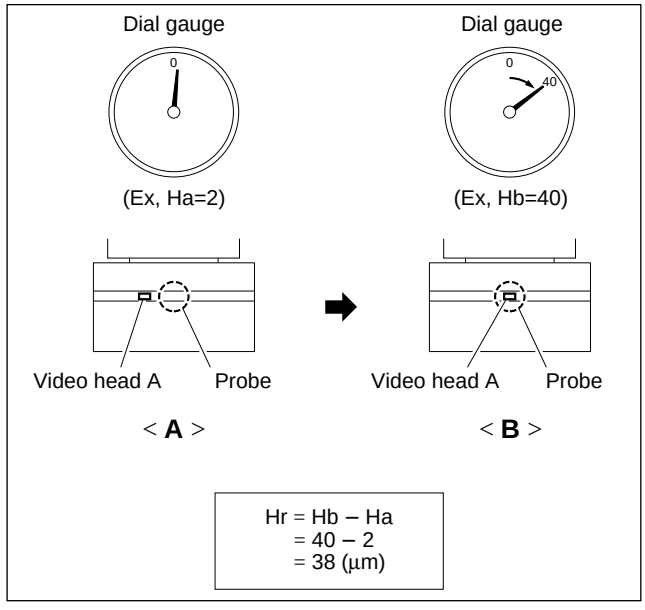


Figure 4. Example of Head Tip Protrus Measurement

This table is in measure order of the heads.

Head name	Spec. (μm)	Head tip protrusion (Hr = Hb – Ha) First time	Second time
CNF A	20	= – | = –	
CNF B	20	= – | = –	
Y-A	20	= – | = –	
C-A	20	= – | = –	
ADV A2	20	= – | = –	
ADV B2	20	= – | = –	
Dummy	–	(No need for measurement)	
Erase	–	(No need for measurement)	
REC A	20	= – | = –	
REC B	20	= – | = –	
Y-B	20	= – | = –	
C-B	20	= – | = –	
ADV A1	20	= – | = –	
ADV B1	20	= – | = –	
Dummy	–	(No need for measurement)	

Removal of Head Tip Protrusion Measurement Gauge

1. Rotate the upper drum manually counterclockwise (↺) very slowly to move a video head aside from the probe.
2. Loosen the adjustment screw of the measurement gauge fully by turning it counterclockwise.
3. Lift up the positioning flange from the outer circumference of the drum's upper surface to a few millimeters, and then lift the measurement gauge slowly and remove it while pushing two legs against the outer circumference of the drum's upper surface (applying force slightly to the measurement gauge in the direction indicated by arrow A). (Refer to Figure 3.)

   Note

   Perform carefully and slowly so that the probe of a measurement gauge does not contact the outer circumference or video heads on the drum.

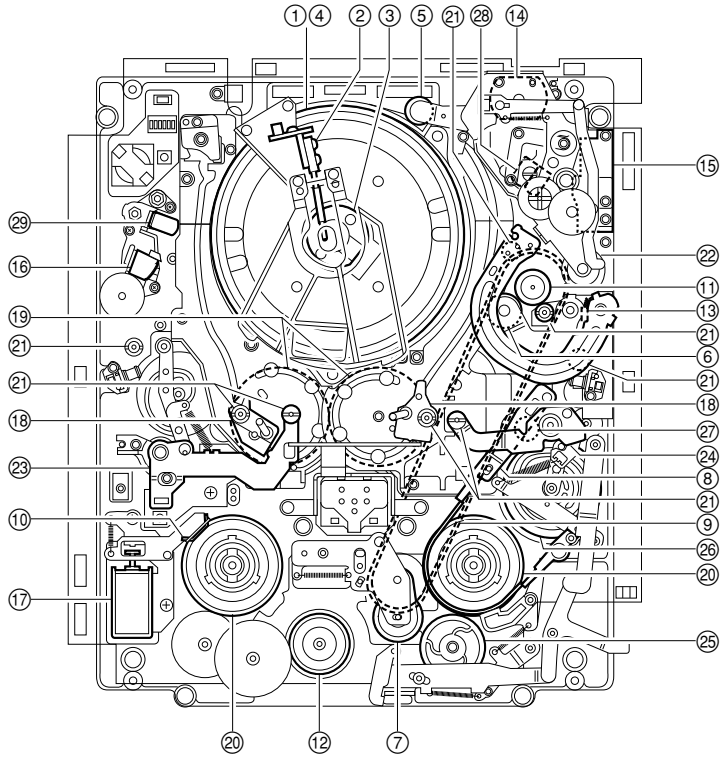
Section 5
Periodic Maintenance Parts Replacement

5-1. General Information on Parts Replacement and Alignment

Reference

In the part replacement described in this section, parts can be replaced with the mechanical deck assembly installed in the main unit unless otherwise specified.
In the figures shown in this section, the main unit's frame is omitted.

5-1-1. Index



No.	Part name	Refer to
①	Upper drum assembly	5-2
②	Brush for slip ring	5-3
③	Slip ring assembly	5-4
④	Drum assembly	5-5
⑤	Video head cleaner	5-6
⑥	Pinch roller	5-7
⑦	Swing gear	5-8
⑧	Tension regulator band	5-9
⑨	Timing belt	5-10
⑩	S main brake shoe	5-11
⑪	Capstan motor	5-12
⑫	S reel motor	5-13
⑬	Tension spring	5-14

No.	Part name	Refer to
⑭	Threading motor	6-1*
⑮	Gear box	6-2*
⑯	Full erase head	6-3*
⑰	S brake solenoid	6-4*
⑱	S/T slider	6-5*
⑲	Threading gear	6-5*
⑳	S/T reel table	6-6*
㉑	Tape guide	6-7*
㉒	Pinch press cam	6-8*
㉓	S tension regulator arm	6-9*
㉔	T tension regulator arm	6-10*
㉕	T idler	6-11*
㉖	Cam gear	6-12*
㉗	Intermittent gear	6-13*
㉘	AT head	6-14*
㉙	CTL head	6-15*

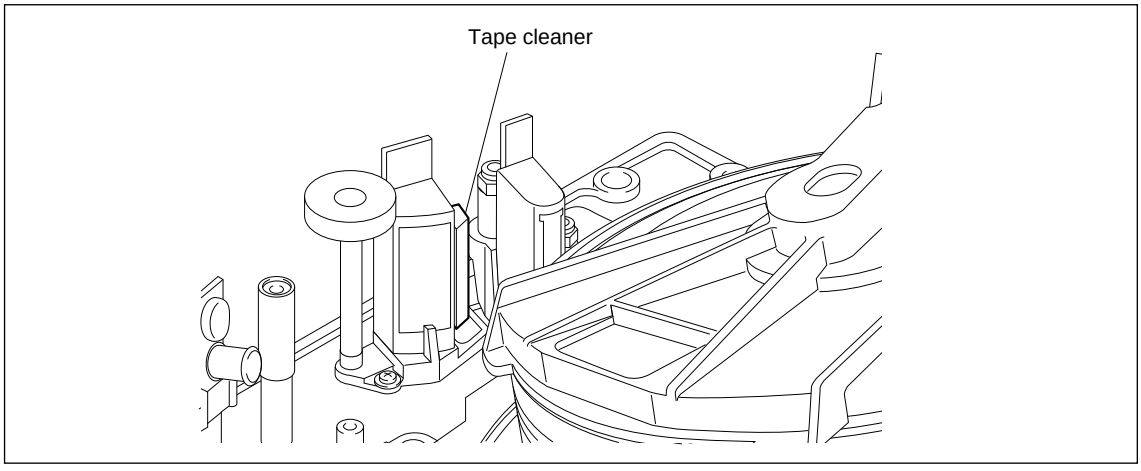
* : Refer to Section 6. Mechanical Parts Replacement.

5-1-2. Precaution

1. Tape cleaner

WARNING

Never touch the tape cleaner on the entrance head block with bare hands.
The tape cleaner has a sharp edge. Pay careful attention when replacing or adjusting the peripheral parts.



2. Tool cleaning

Clean the surface of tools before using them.

- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01

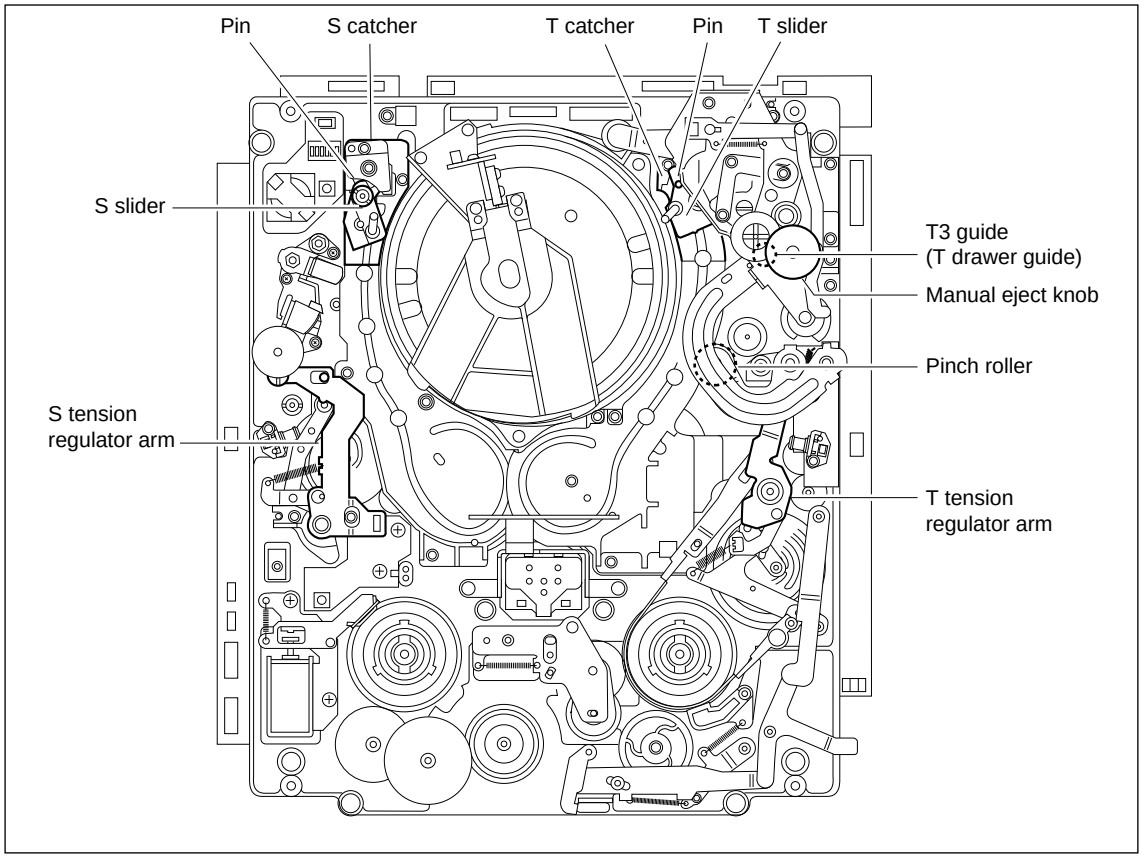
Take care not to damage the tool when handling it.
If damaged tool is used, the correct adjustment may not be carried out.

5-1-3. Threading End and Unthreading End States

1. Threading end state

In the threading end state, the S/T slider, S tension regulator arm and other some component parts are positioned to the following states.

- The S and T sliders move from the reel table side to both sides of the drum, and then the pins of the S and T sliders stop in the V grooves of each catcher. The S tension regulator arm, T3 guide, pinch roller, and T tension regulator arm move to the positions shown in the figure.



Entering the threading end state using tape

(1) Turn on the power.
(2) Insert a cassette tape into the cassette compartment.

Entering the threading end state manually

Turn the manual eject knob clockwise until the top of the T3 (T drawer guide) push the stopper after moving downward and turning clockwise.

Note

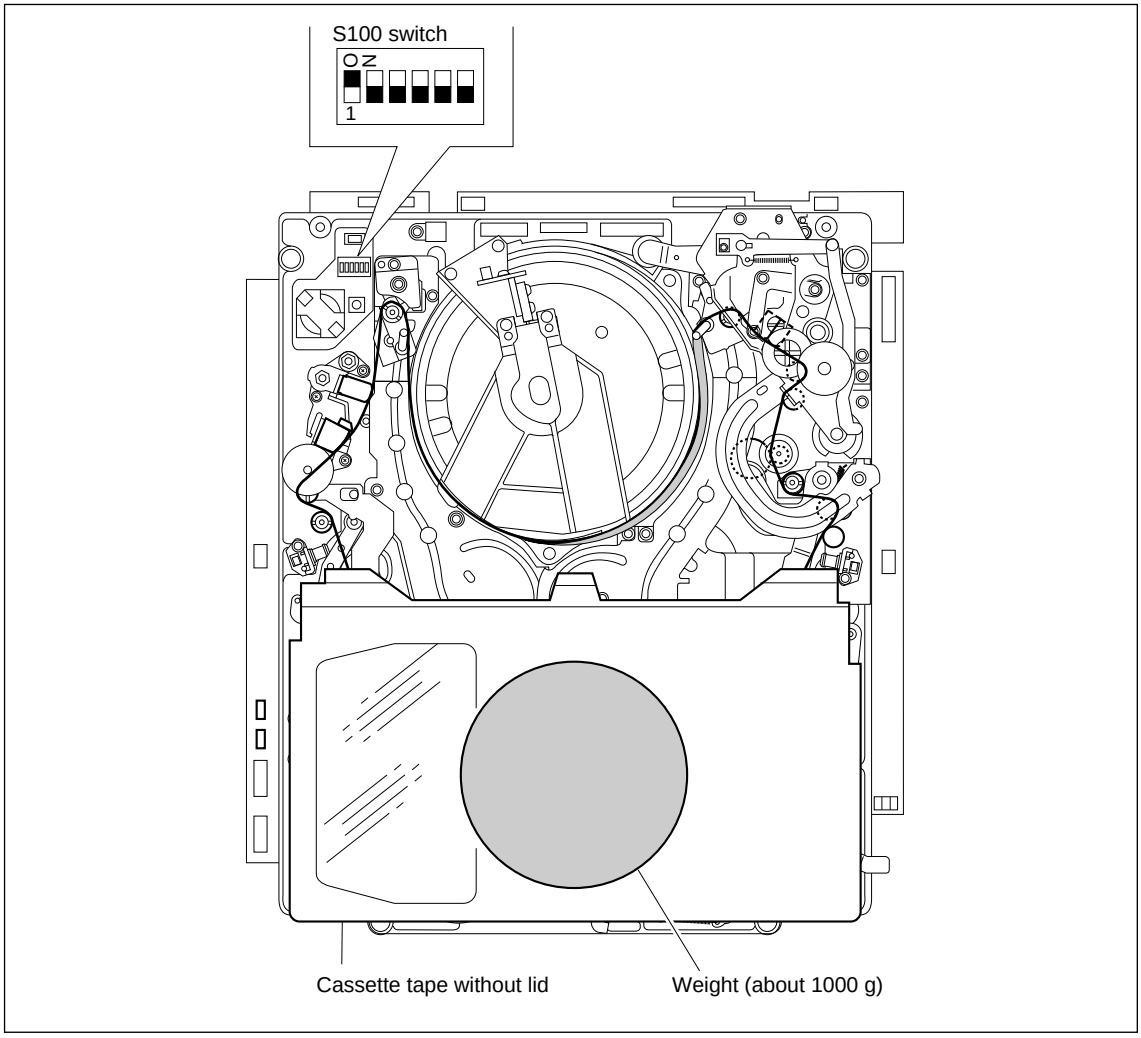
Stop the rotation of the manual eject knob when the above mentioned threading end state is just entered. If not, the related gears may be damaged.

Entering the threading end state with the cassette compartment removed (during tape path adjustment)

(1) Set the switch S100-1 on the SV-194A board to ON.
(2) Turn on the power.
(3) Press the EJECT button.
(If the EJECT button is not pressed, the unit is entered into the error mode due to the threading end state.)
(4) Press the STOP button.
(5) Put the cassette tape without lid on the mechanical deck, and then put a weight on it.

Reference

- Use a weight of about 1000 g.
- As for how to remove a lid from the cassette tape, refer to Section 7-1.



2. Unthreading end state

In the unthreading end state, the S and T sliders move from the S and T catchers to the reel table side, and then stop. At the same time, the S tension regulator arm and T tension regulator arm are located in the positions shown in the figure.

Entering the unthreading end state with the cassette compartment removed

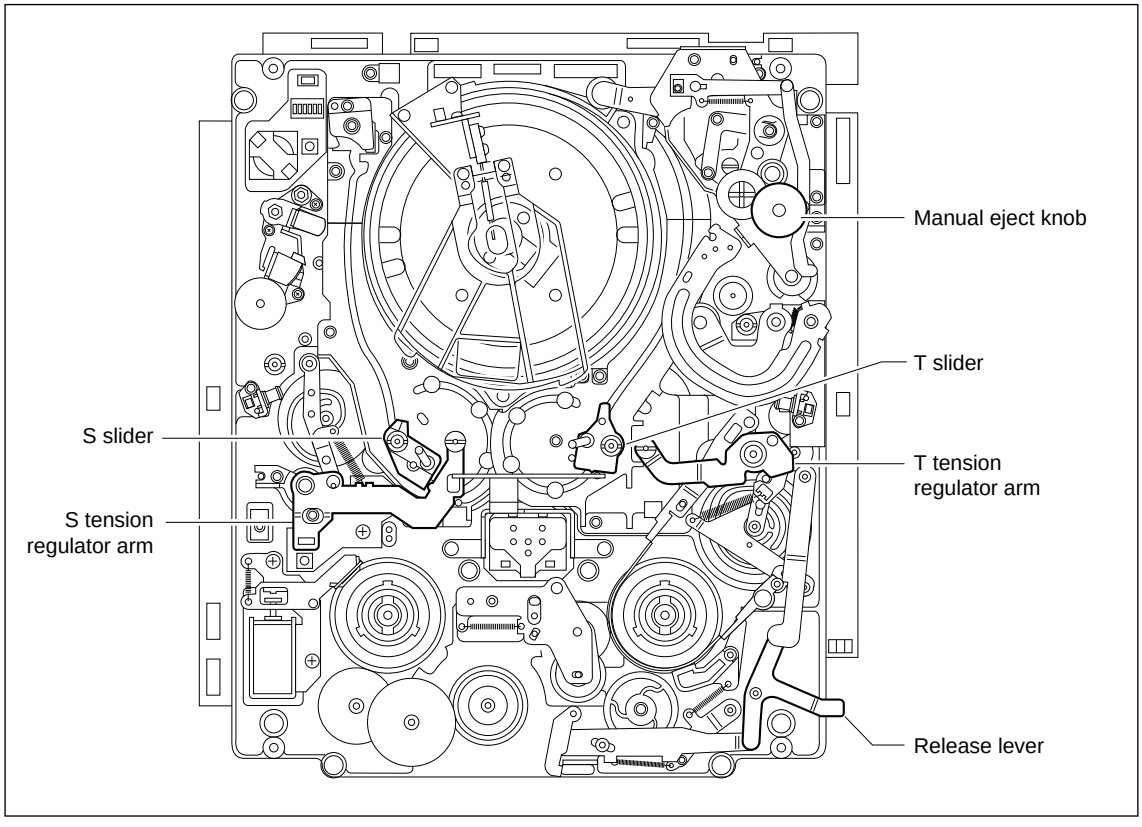
(1) Set the switch S100-1 on the SV-194A board to ON.
(2) Turn on the power.
(3) Press the EJECT button.

Entering the unthreading end state manually

Turn the manual eject knob counterclockwise.

Note

Stop the rotation of the manual eject knob when the unit put into the unthreading end state.
If it is rotated over, the gear may be damaged.

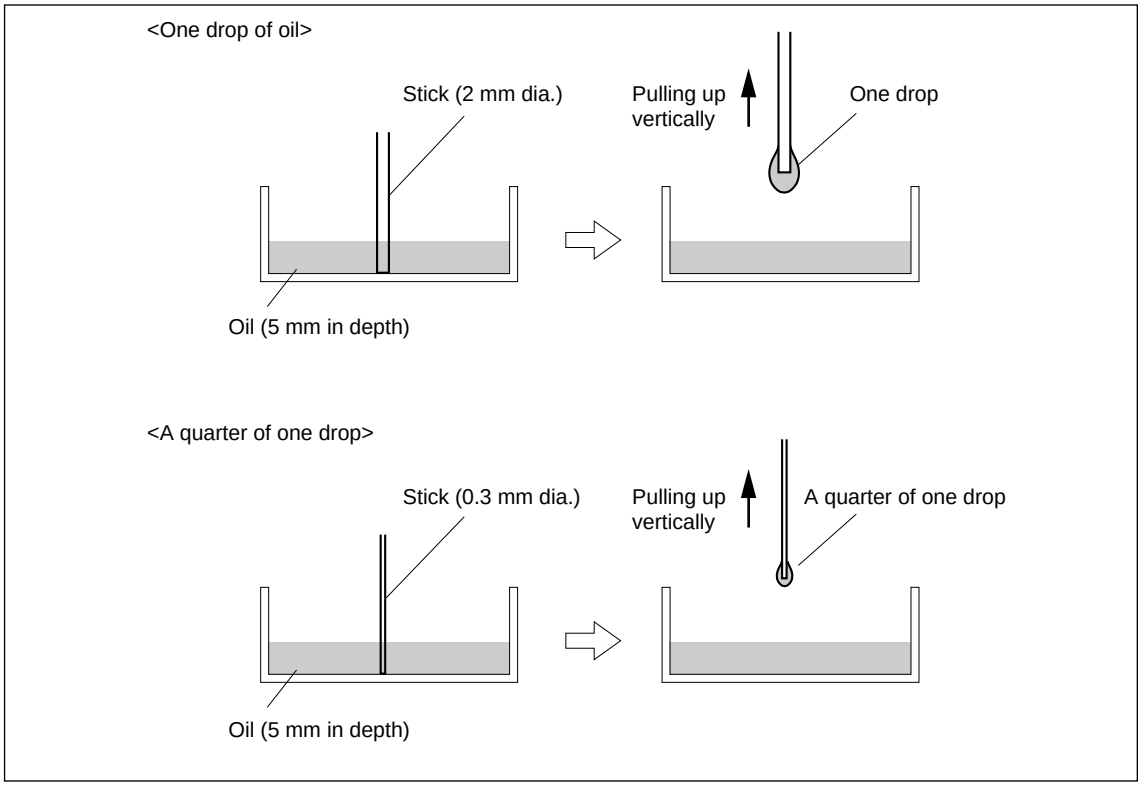


5-1-4. Oil and Grease

Be sure to use the specified oil and grease.
If not, a serious failure may occur in the unit because of difference in viscosity and components.
Do not use oil or grease in which dust is mixed. This may also cause a serious failure.
The oil and grease used in this model are as follows :

Oil :	7-661-018-18
Grease (SGL-601) :	7-651-000-10
Grease (SGL-801) :	7-651-000-11
Grease (PG-662) :	7-615-000-59

- Oil of one drop indicates the amount at the tip of a stick with diameter of 2 mm shown in the figure. Oil of a quarter of one drop indicates the amount at the tip of a stick with diameter 0.3 mm shown in the figure. Applying oil described in this manual means this a quarter drop of oil applying.
- Apply grease on the surface of the part like a thin film. If grease smeared apart from the relevant areas, be sure to wipe using a gauze or soft cloth.
- Apart from the relevant areas never use oil and grease.



5-1-5. Tightening Torque and Washers

1. Tightening torque and screwdriver

This model uses many M1.4 and M2 screws.
Be sure to use the specified tool when loosening or tightening these screws.
Use a torque screwdriver and tighten the screws with the specified tightening torque.

Torque screwdriver bit (for M1.4) : J-6325-110-A
Torque screwdriver bit (for M2) : J-6325-380-A
Hexagon bit (Across flat has 1.5 mm) : J-6326-120-A
Torque screwdriver (for 3 kg) : J-6325-400-A

Tightening torque

For M1.4 screw : 9×10^{-2} N•m {0.9 kgf•cm}
For M2 screw : 20×10^{-2} N•m {2.0 kgf•cm}

Reference

This model uses small-sized screws. Be careful not to drop these screws in the unit during removal and installation. We recommend to magnetize the screwdriver bit to prevent that the screws drop.

2. Stop washers and E ring

Do not re-use the stop washer and E ring once they are removed. Be sure to use a new stop washer and E ring when installing parts.

Stop washer (ø2.5) : 3-315-384-11
Stop washer (ø3.6) : 3-559-408-11
E ring (2.3) : 7-624-105-04

Removing the stop washer and E ring

(a) Remove the stop washer and E ring using small pliers or tweezers.

Notes

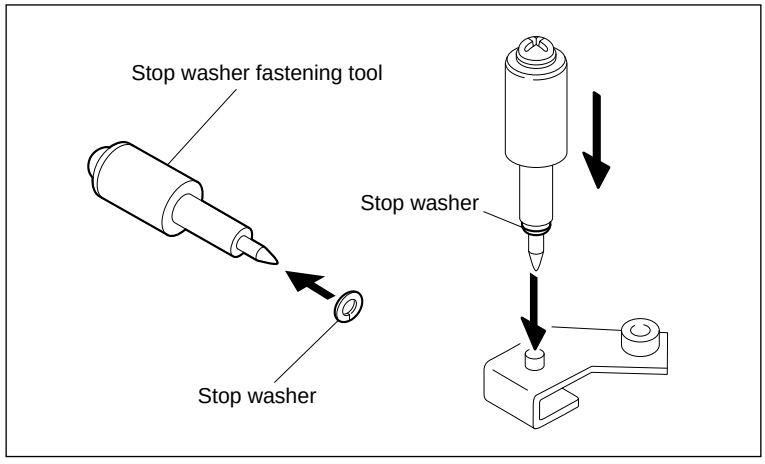
- Be careful not to drop the stop washer and E ring in the unit.
- Take care that the tool does not contact other parts, especially, the drum.

Installing the stop washer

It is recommended to use the tool below when installing the stop washer.

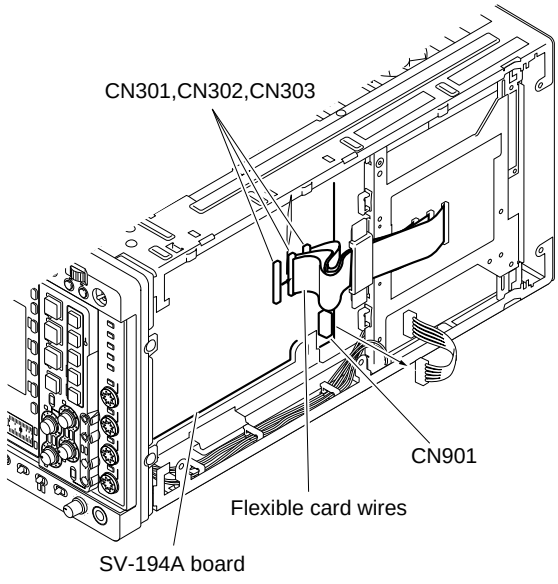
Stop washer fastening tool : J-6323-530-A

(a) Insert a stop washer into the thin tip of a stop washer fastening tool.
(b) Put the thin tip of the tool on the top of the shaft to be installed in a upright position.
(c) Push the tool downward and install the stop washer to the shaft.



5-1-6. Mechanical Deck Assembly Removal and Reinstallation

1. Remove the top plate. (Refer to Section 1-4-1.)
2. Remove the bottom plate. (Refer to Section 1-4-2.)
3. Remove the DM-114/114P board. (Refer to Section 1-6-2.)
4. Disconnect the three flexible card wires from the connectors (CN301, CN302, and CN303) on the SV-194A board.
5. Disconnect the harness connector from the connector (CN901) on the SV-194A board.
6. Put the unit back to the original position.



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7. Remove the cassette compartment. (Refer to Section 1-5.)
8. Disconnect the harness connector from the connector (CN1) on the SV-194A board.
9. Unfasten the harness clamp A shown in the figure.
10. Disconnect the harness connector (CN1) from the drum assembly board.
11. Disconnect the brush harness from the connector.
12. Disconnect the harness connector from the connector (CN801) on the SV-194A board.
13. Disconnect the harness connector of the AT head from the connector (CN1) on the PA-218 board.
14. Unfasten the AT head harness from the two harness clamps (C and D).
15. Disconnect the harness connector from the connector (CN602) on the SV-194A board.
16. Loosen the four hexagon cap screws fully shown in the figure.

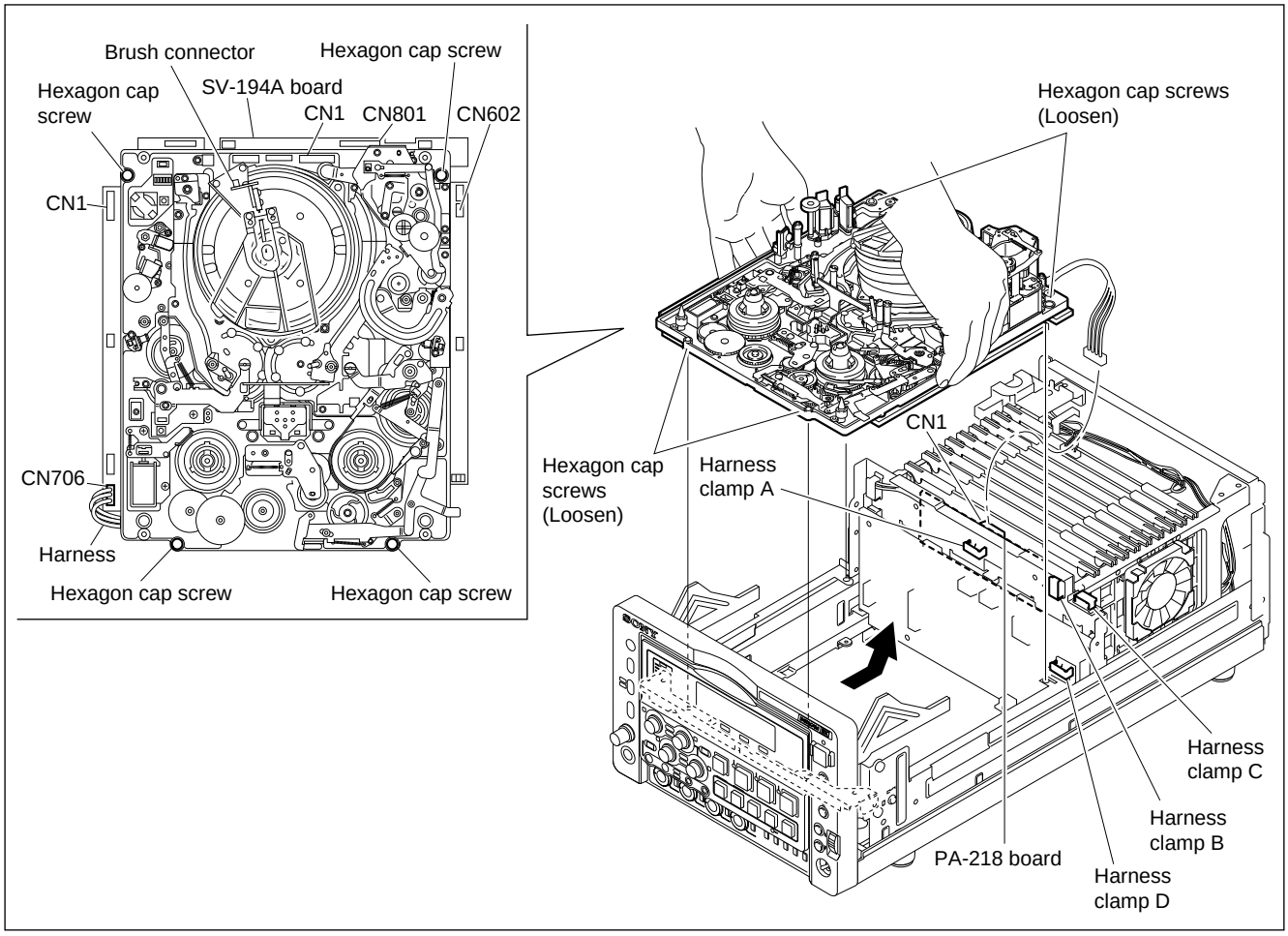
Note

Each screw has a stopper to prevent it from being removed.

17. While keeping the red and blue harnesses connected to the connector CN706 on the SV-194A board out of the way of removal, lift the mechanical deck out in the direction indicated by the arrow.

Note

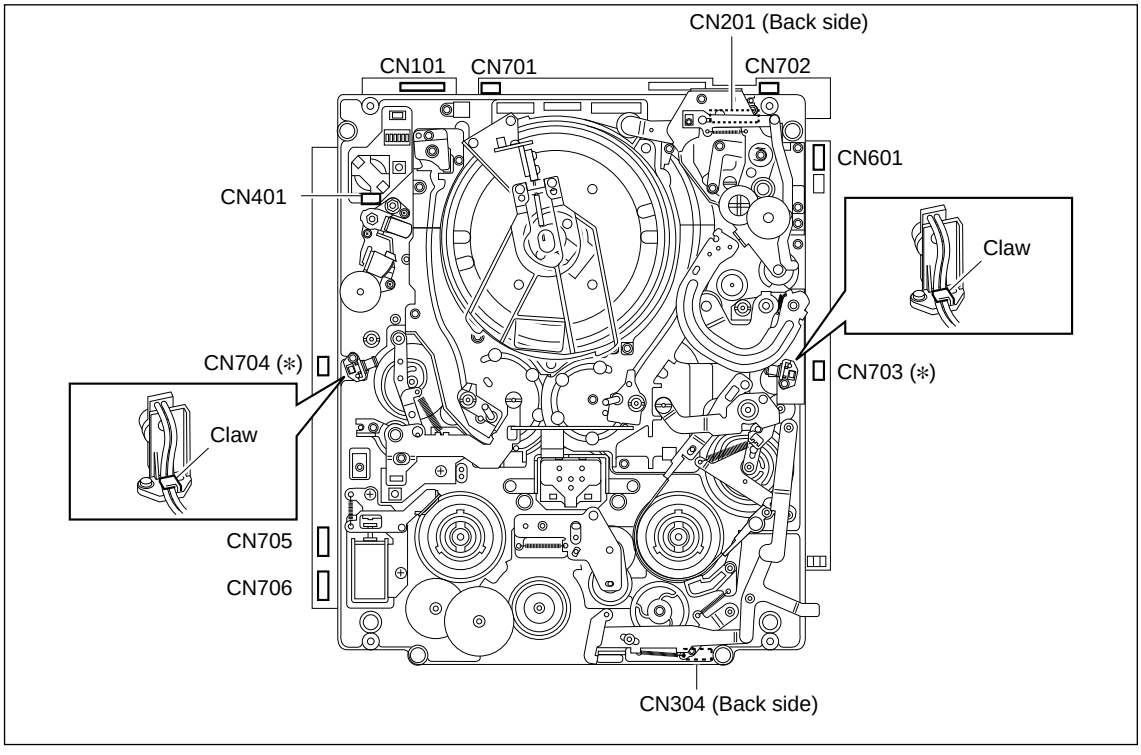
Put the mechanical deck on a soft cushion (e.g., sponge). Particularly, be careful not to apply excessive force to the hybrid IC on the SV-194A board faces up.



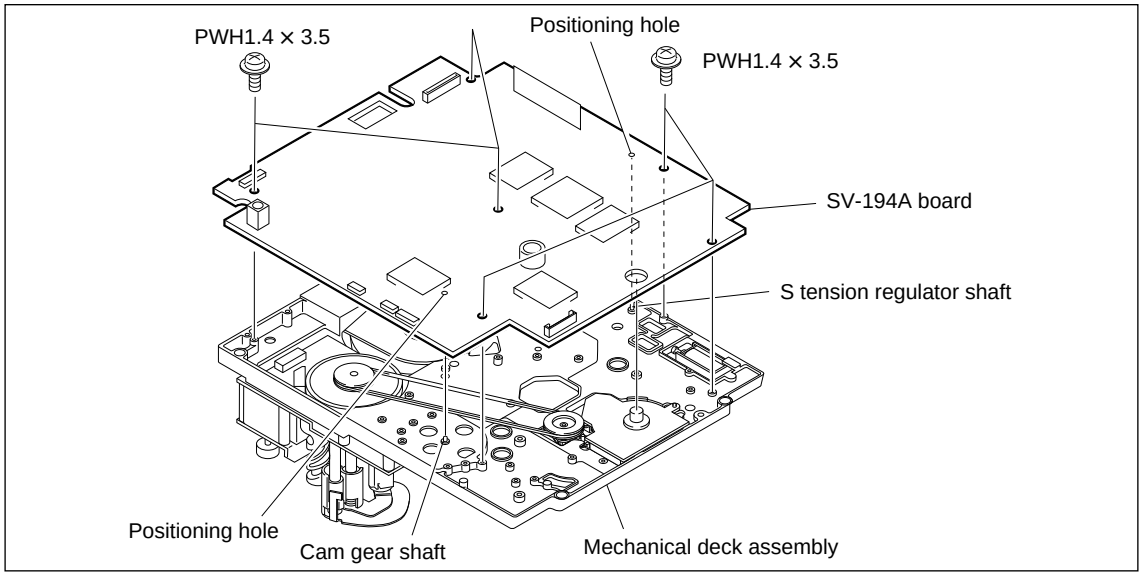
18. Disconnect the harness from the connectors on the SV-194A board below.
    - CN101 (Drum SV harness)
    - CN701 (Dew condensation sensor harness)
    - CN702 (Threading motor harness)
    - CN601 (AT head harness)
    - CN201 (Capstan motor harness)
    - CN703 (Tape top sensor harness) (∗)
    - CN304 (S reel motor harness)
    - CN706 (Brake solenoid harness)
    - CN705 (Tension sensor harness)
    - CN704 (Tape end sensor harness) (∗)
    - CN401 (Entrance head harness)

Note

When disconnecting the connector with ∗ mark, being careful not to break the claw of the harness clamp portion on the sensor holder, disconnect the harness while holding the claw by a finger.



19. Remove the six screws, and then remove the SV-194A board.



20. Reattach the mechanical deck assembly in the reverse order of removal.

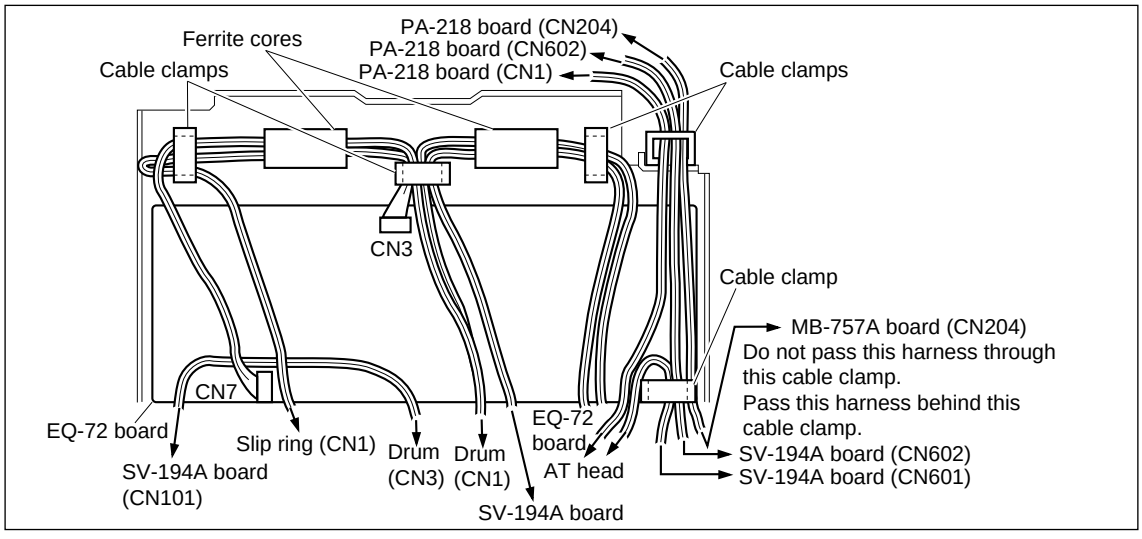
Note

After reattaching the mechanical deck, arrange the harness around the EQ-72 board.

(1) Clamp the harnesses between the EQ-72 board and drum assembly with the five cable clamps shown in the figure.

(2) Press the harnesses around the drum assembly toward the EQ-72 board so as not to contact them with drum assembly.

(3) Arrange the harnesses around the right side of the chassis shown in the figure so as not to come loose from the chassis.



Note

Perform the confirmation or adjustment below after reattaching the mechanical deck assembly.

- Tape running check or adjustment
- Video tracking check or adjustment
- CTL head position check or adjustment
- AT head position check or adjustment

5-2. Upper Drum Assembly Replacement

Outline

Replacement

Drum cover removal
Brush assembly removal
Slip ring assembly removal
Upper drum assembly removal
Installation surfaces cleaning
Upper drum assembly installation
Slip ring assembly reinstallation
Brush assembly reinstallation
Drum cover reinstallation
Video head and tape running surfaces cleaning

Adjustment after replacement

Video tracking adjustment
CTL head position adjustment
AT head position adjustment
Electrical adjustment after drum replacement

Precaution

Replace the upper drum assembly when the video heads are worn or damaged. Only the head chip cannot be replaced independently.

Basic knowledge

For except the periodic replacement, replace the upper drum in the following case.

- When no proper RF waveform is obtained even if the tracking adjustment is performed

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

- Torque screwdriver bit (for M2) : J-6325-380-A
- Hexagon bit (Across flat has 1.5 mm) : J-6326-120-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- L-shaped wrench (Across flat has 1.5 mm) : 7-700-736-05
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01

Removal

1. Drum cover removal

Remove the drum cover. (Refer to Section 5-3.)

2. Brush assembly removal

Remove the brush assembly.
(Refer to Section 5-3.)

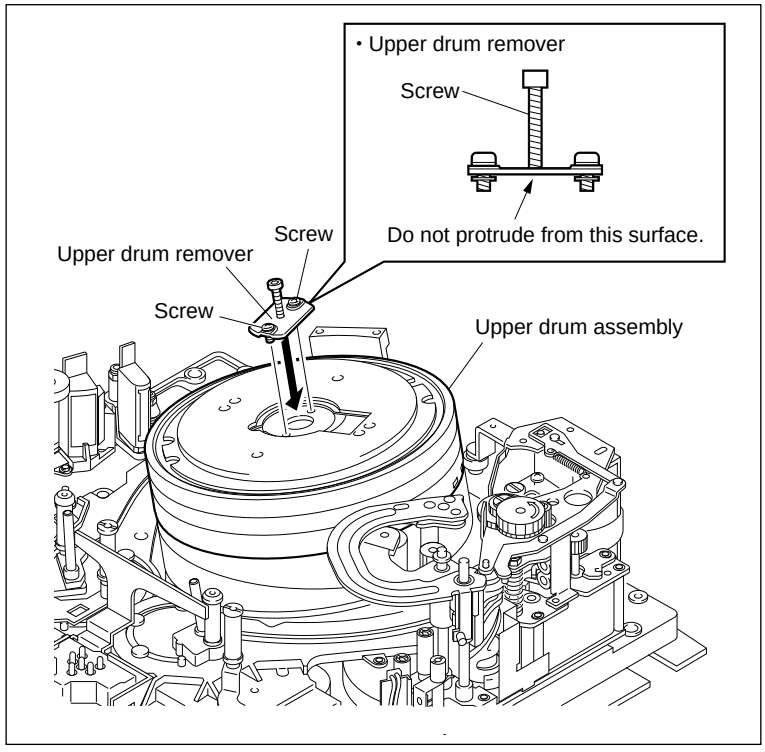
3. Slip ring assembly removal

Remove the slip ring assembly.
(Refer to Section 5-4.)

4. Upper drum assembly removal

(1) Prepare the upper drum remover supplied with a new upper drum assembly.
Loosen the screw of the upper drum remover being careful not to protrude the screw from the installation surface.

(2) Attach the upper drum remover to the upper drum assembly with the two screws.



(3) Insert the L-shaped wrench into the holes on the upper drum assembly board, and then fully loosen the four screws which fixing the upper drum.

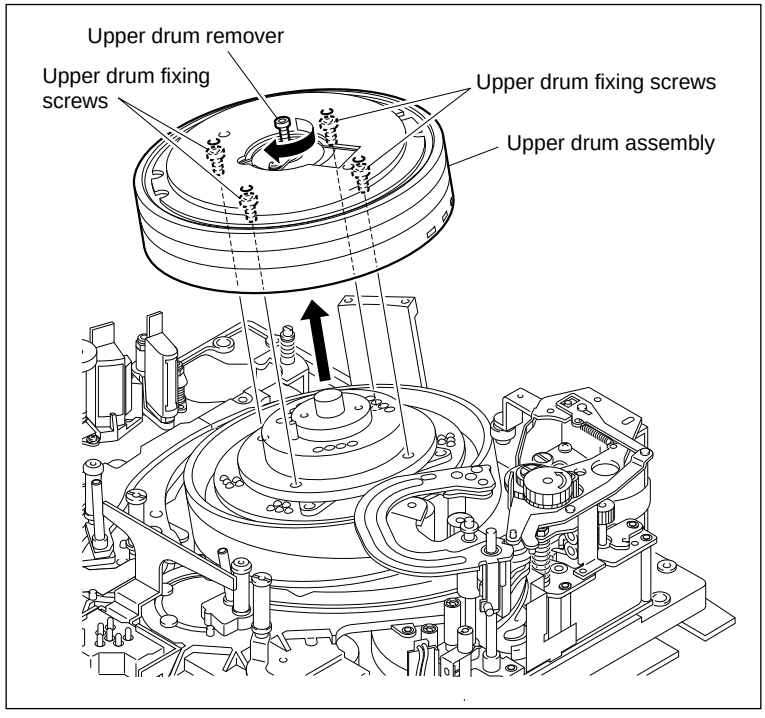
Note

Be sure to fully loosen the four upper drum fixing screws. Do not turn the screw of the upper drum remover without loosening these screws fully. If not, this may damage the lower drum.

(4) Tighten the screw in the center of the upper drum remover using an L-shaped wrench, and then lift out the upper drum assembly in the direction indicated by the arrow.

Note

Be careful not to damage the upper edge of the lower drum after removing the upper drum assembly.



Reinstallation

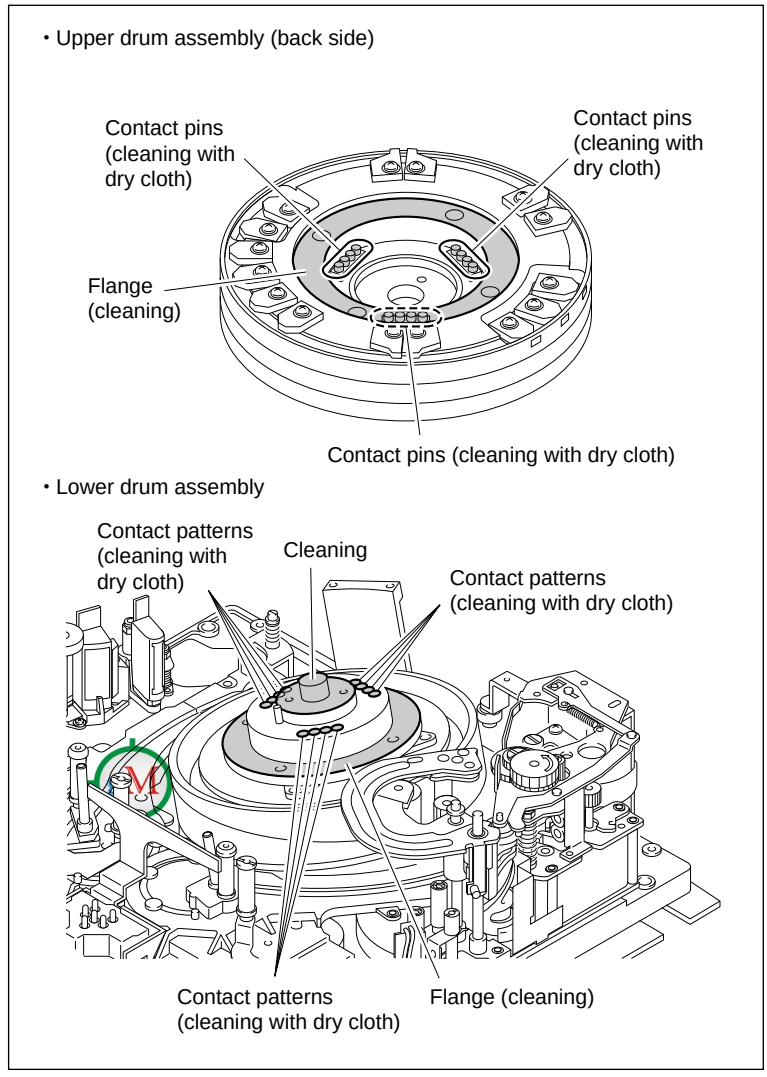
5. Installation surfaces cleaning

(1) Clean the following portions with cleaning cloth moistened with cleaning fluid.
- Flange surfaces of the lower drum (portions shown in the figure)
- Tape running surface and lead of the lower drum
- Installation surface of a new upper drum assembly (portion shown in the figure)

(2) Wipe the twelve contact pins of the upper drum and the twelve contact patterns of the lower drum board.

Note

Do not apply cleaning fluid to the contact pins and contact patterns.

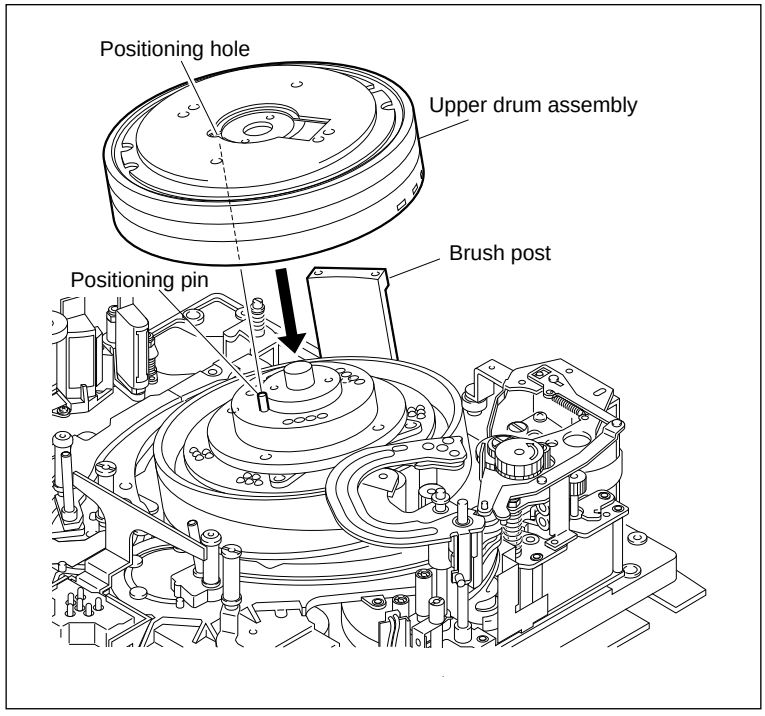

• Upper drum assembly (back side)
Contact pins (cleaning with dry cloth)
Contact pins (cleaning with dry cloth)
Flange (cleaning)
Contact pins (cleaning with dry cloth)
• Lower drum assembly
Contact patterns (cleaning with dry cloth)
Cleaning
Contact patterns (cleaning with dry cloth)
Contact patterns (cleaning with dry cloth)
Flange (cleaning)

6. Upper drum assembly installation

(1) Align the positioning hole of the upper drum assembly with the positioning pin of the lower drum as shown in the figure, and then put the upper drum assembly on the lower drum. At that time, ensure that the positioning pin protrudes from the upper surface of the upper drum.

Notes

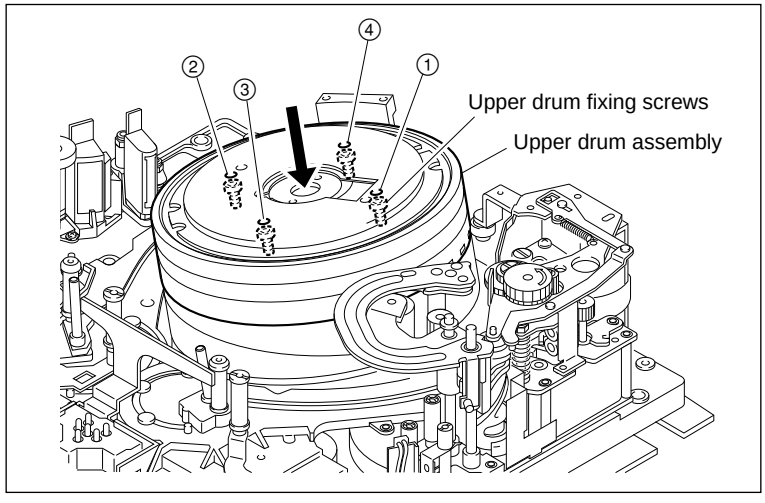
- Grasp the upper drum assembly by the portion where the video heads does not exist.
- Take care that the video heads does not contact with the brush post and its peripheral parts when attaching the upper drum assembly.
- When the upper drum assembly is put on the lower drum, never push the outer circumferential part of the drum.



(2) Push the center part of the upper drum with a finger just downward to bring the upper drum in contact with the flange of the lower drum.

(3) While keeping the state in step (2), tentatively tighten the four screws in the order shown in the figure at the follwing torque.
Tightening torque : 10×10^{-2} N•m
{1.0 kgf•cm}

(4) Tighten the four screws at the following torque.
Tightening torque : 25×10^{-2} N•m
{2.5 kgf•cm}



7. Slip ring assembly reinstallation

Install the slip ring assembly.
(Refer to Section 5-4.)

8. Brush assembly reinstallation

Install the brush assembly. (Refer to Section 5-3.)

9. Drum cover reinstallation

Install the drum cover. (Refer to Section 5-3.)

10. Video head and tape running surfaces cleaning

Clean the portions below with a cleaning cloth moistened with a cleaning fluid.

- Tape running surface of the upper drum and video heads (Refer to Section 4-2-3.)
- Lead and tape running surface of lower drum (Refer to Section 4-2-4.)

Note

After cleaning, wipe with a dry cleaning cloth.

Adjustment after replacement

11. Video tracking adjustment

(Refer to Section 7-5.)

12. CTL head position adjustment

(Refer to Section 7-7.)

13. AT head position adjustment

(Refer to Section 7-8.)

14. Electrical adjustment after drum replacement

(Refer to Section 8.)

5-3. Brush Replacement

Outline

Replacement

Drum cover removal
Brush assembly removal
Brush assembly installation
Drum cover reinstallation

Precautions

- The adjustment after replacement is not required in this case.
  The relative height and contact pressure to the slip ring are automatically adjusted after installing the brush assembly according to the procedures below.
- Never clean the brush surface with a cleaning cloth moistened with a cleaning fluid.

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)

Reference

The brush assembly can be replaced with the cassette compartment attached.

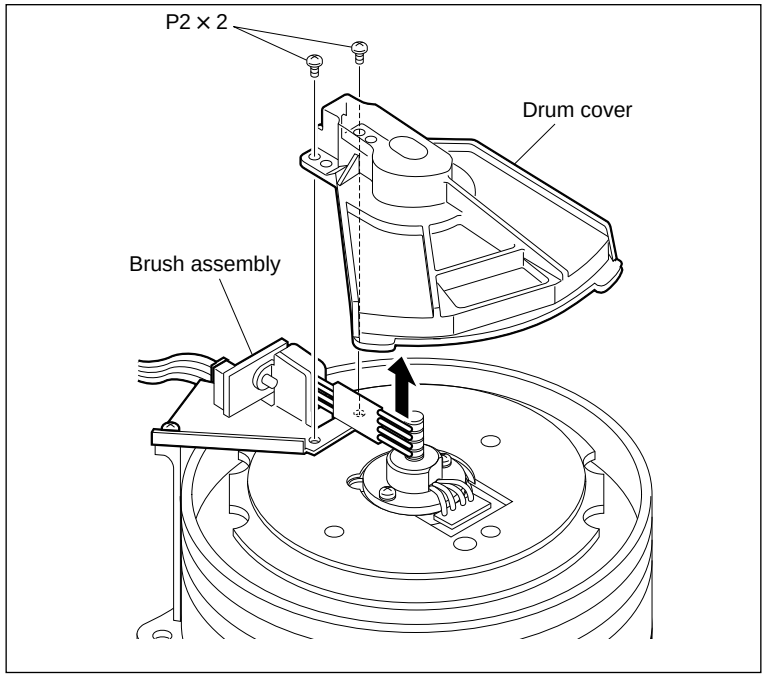
Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

Removal

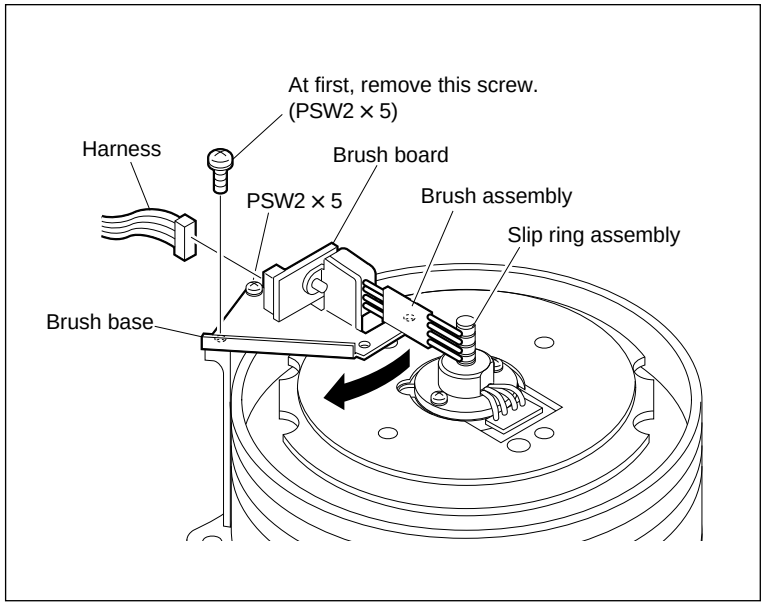
1. Drum cover removal

Remove the two screws to remove the drum cover.



2. Brush assembly removal

(1) Disconnect the harness connected to the brush board.
(2) Remove the screw shown in the figure of the two screws fixing the brush base.
(3) Loosen the other screw, and then move the brush base in the direction indicated by the arrow.
The engagement of the brush and slip ring is then released.
(4) Remove the screw, and then remove the brush assembly.

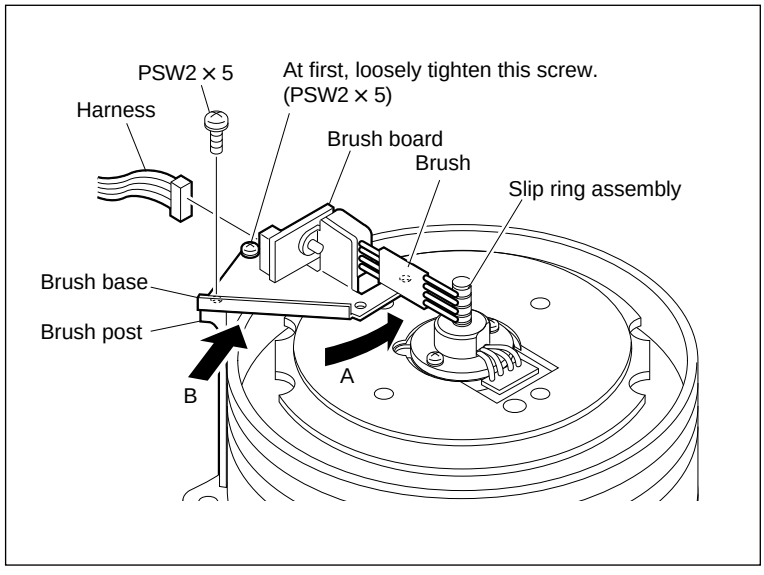


Installation

3. Brush assembly installation

(1) Fix the brush base tentatively to the brush post with the screw shown in the figure.
Note
Never touch the brush.

(2) Move the brush base in the direction indicated by arrow A while pushing it downward at the top of the brush post, and loosely tighten the other screw.
(3) While pushing the brush base in the direction indicated by arrow B, tighten the two screws again.
Tightening torque : 20×10^{-2} N•m
{2.0 kgf•cm}
(4) Reconnect the harness disconnected in step (1) of procedure 2 to the connector on the brush board.



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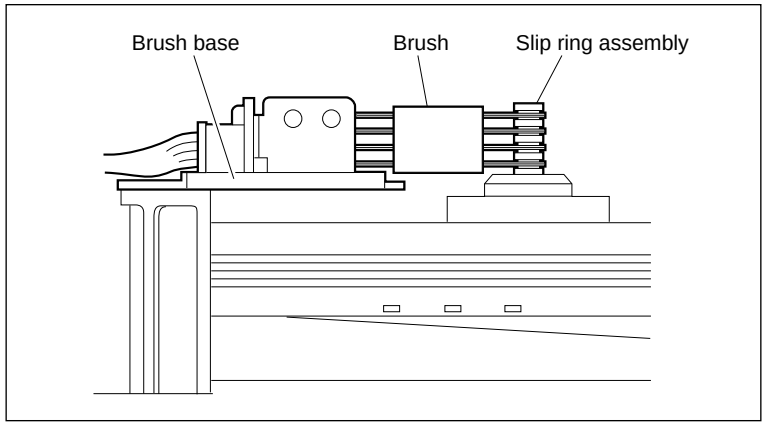
(5) Ensure that the brush precisely contacts the grooves of the slip ring.

Reference

The brush height and the contact pressure to the slip ring are automatically adjusted by executing steps (1) to (3).



4. Drum cover reinstallation

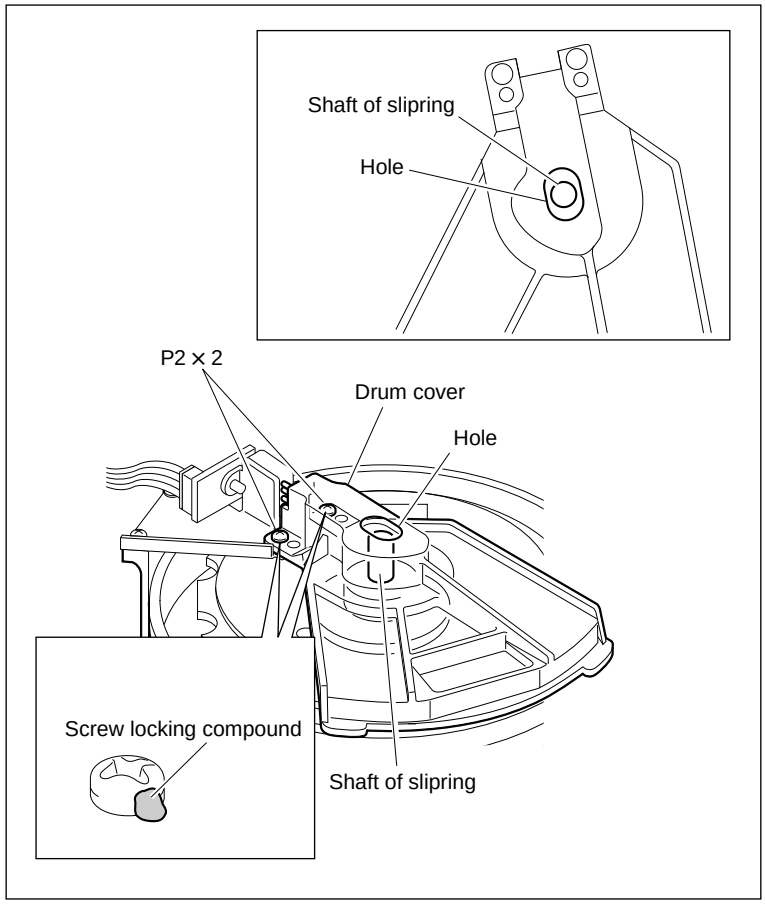
(1) Align the drum cover so that the shaft of the slip ring is almost located in the center of the hole at the tip of the drum cover, and then fix the cover with the two screws.
Tightening torque : 10×10^{-2} N•m
{1.0 kgf•cm}

Note

Be careful not to apply an excessive force to the brush base.

(2) Apply the screw locking compound to the two screws.

(3) Recheck that the brush precisely contacts the grooves of the slip ring.



5-4. Slip Ring Assembly Replacement

Outline

Replacement

Drum cover removal
Brush assembly removal
Slip ring assembly removal
Slip ring assembly installation
Brush assembly reinstallation
Drum cover reinstallation

Precautions

- The adjustment after the slip ring assembly replacement is not required.
- Never clean the slip ring surface with cleaning cloth moistened with cleaning fluid.

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)

Reference

The brush assembly can be replaced with the cassette compartment attached.

Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

Removal

1. Drum cover removal

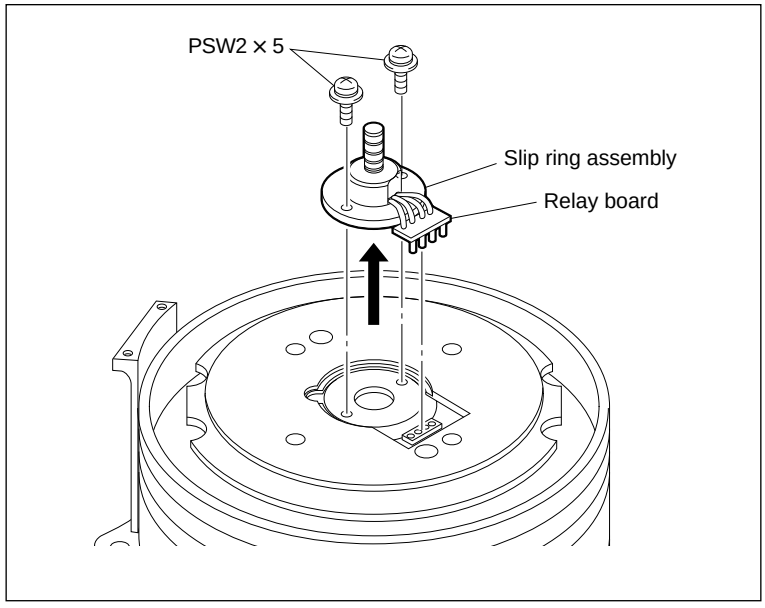
Remove the drum cover. (Refer to Section 5-3.)

2. Brush assembly removal

Remove the brush assembly. (Refer to Section 5-3.)

3. Slip ring assembly removal

(1) Remove the two screws to remove the slip ring assembly.
(2) Pull the small relay board out just above which the lead wires are soldered.



Installation

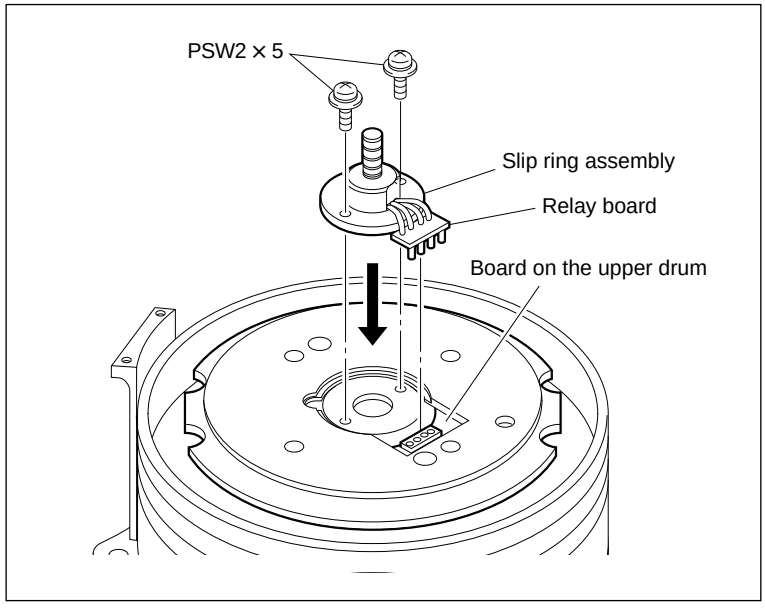
4. Slip ring assembly installation

(1) Attach a new slip ring assembly in the drum shaft as shown in the figure.

Note

Never contact the slip ring during installation.

(2) Fix the slip ring assembly with the two screws.
Tightening torque : 20×10^{-2} N•m
{2.0 kgf•cm}
(3) Reconnect the small relay board of the slip ring assembly to the board on the upper drum assembly.



5. Brush assembly reinstallation

Reattach the brush assembly.
(Refer to Section 5-3.)

6. Drum cover reinstallation

Reattach the drum cover. (Refer to Section 5-3.)

5-5. Drum Assembly Replacement

Outline

Replacement

Drum assembly removal
Installation surfaces cleaning
Drum assembly installation
Video heads and tape running surfaces cleaning

Adjustment after replacement

Tape running adjustment
Video tracking adjustment
CTL head position adjustment
AT head position adjustment
Electrical adjustment after drum replacement

Precaution

Be careful not to damage the CTL head, AT head, and peripheral tape guides when replacing the drum assembly.
Take care that the video heads of the drum assembly is not damaged during replacement.

Basic knowledge

For except the periodic replacement, the drum assembly replacement is required in the following cases :

- When the damaged upper drum assembly or tape running surface cannot be recovered
- When no proper RF waveform can be obtained during tracking adjustment because of the worn upper drum assembly or lower drum
- When the VTR performance cannot be satisfied due to noises or jitters because of its bearing life

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)
5. Remove the VH cleaner assembly. (Refer to Section 5-6.)

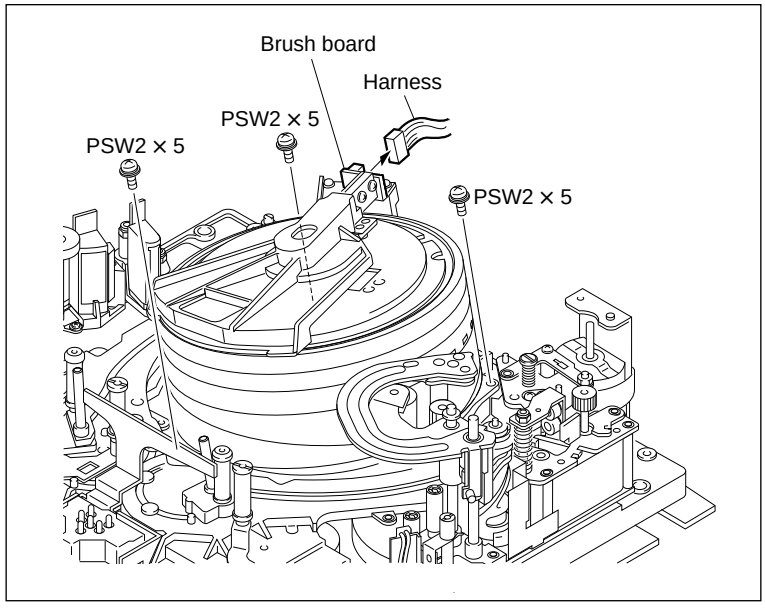
Tools

- Torque screwdriver’s bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01

1. Drum assembly removal

(1) Disconnect the connector connected to the brush board.

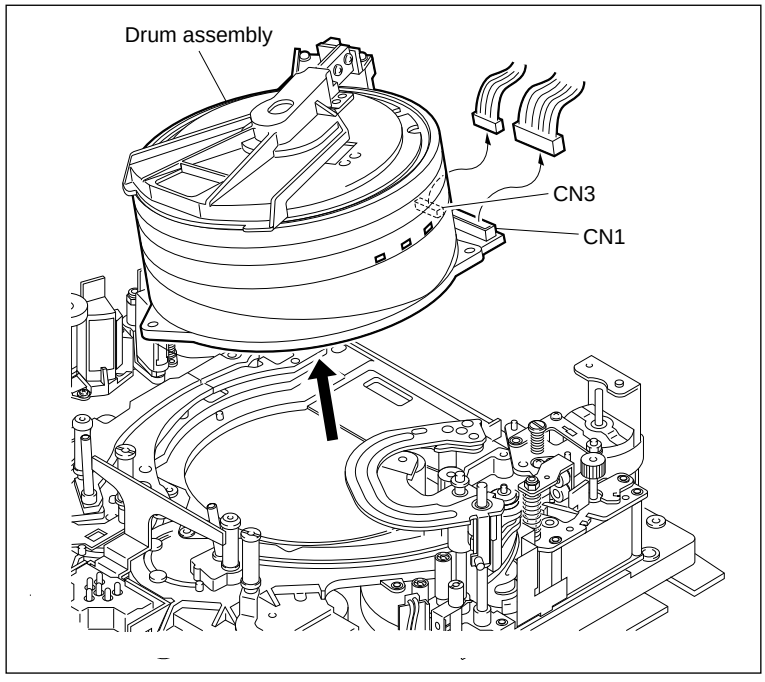
(2) Remove the three screws fixing the drum assembly.



(3) Lift the drum assembly out just above, and then disconnect the two connectors (CN1 and CN3) connected to the board below the drum. The drum assembly can be then removed.

Note

Be careful not to damage the CTL head, AT head, and peripheral tape guides when removing the drum assembly.



Installation

2. Installation surfaces cleaning

Wipe the installation surfaces of a new drum assembly and chassis with a cleaning cloth moistened with a cleaning fluid.

3. Drum assembly installation

(1) Hold the new drum assembly and connect the two connectors (CN1 and CN3) disconnected in step (3) of procedure 1.

Notes

- Be sure to grasp the drum assembly by portion in which no video heads exist when handling the new drum assembly.
- Take care that the drum assembly does not contact the CTL head, AT head, and peripheral tape guides.
- Do not apply an excessive force to the brush.

(2) Connect the harness connector to the brush board.

(3) Align the two positioning pins of the chassis with the holes of the drum assembly, and then put the drum.

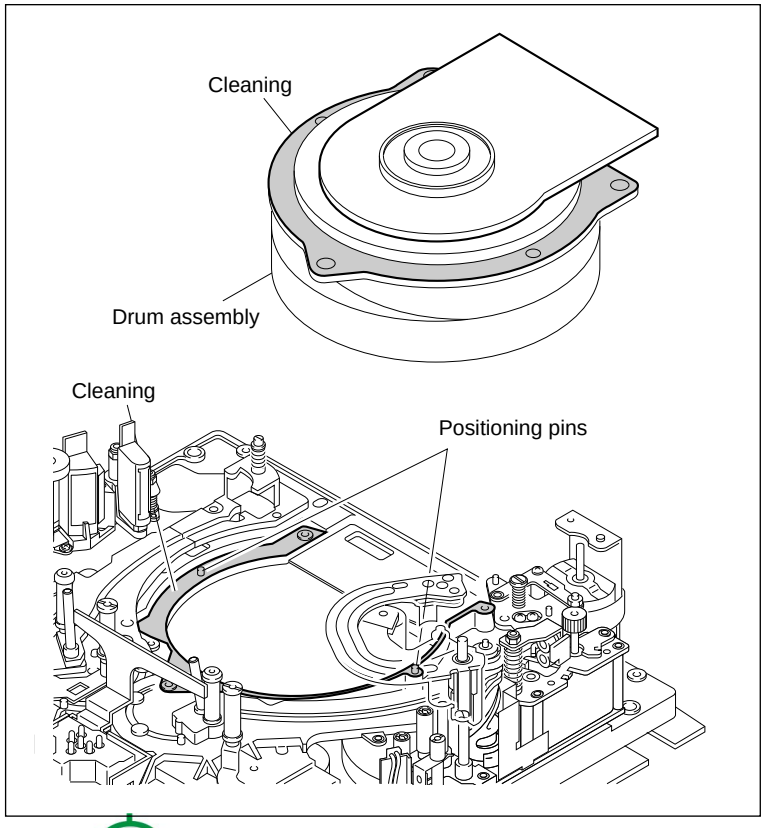
(4) Check that the positioning pins is firmly inserted into the drum assembly by moving the drum slightly.

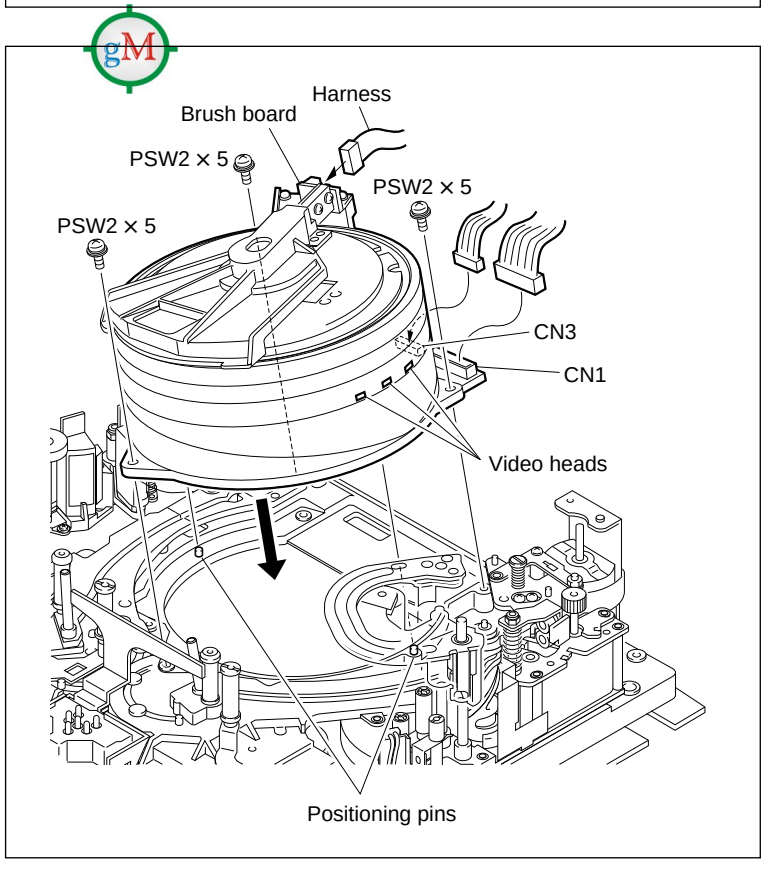
(5) Tighten the three screws.
Tightening torque : 20×10^{-2} N•m
{2.0 kgf•cm}

Note

Be sure to turn the drum so that the video heads are away from the screwdriver.

(6) Ensure that the brush precisely contacts the grooves of the slip ring.





4. Video heads and tape running surfaces cleaning

Clean the portions below with a cleaning cloth moistened with a cleaning fluid.

- Tape running surfaces of the upper drum and video heads (Refer to Section 4-2-3.)
- Lead and tape running surfaces of lower drum (Refer to Section 4-2-4.)

Note

After cleaning, wipe with a dry cleaning cloth.

Adjustment after replacement

5. Tape running adjustment

(Refer to Section 7-4.)

6. Video tracking adjustment

(Refer to Section 7-5.)

7. CTL head position adjustment

(Refer to Section 7-7.)

8. AT head position adjustment

(Refer to Section 7-8.)

9. Electrical adjustment after drum replacement

(Refer to Section 8)

5-6. Video Head Cleaner Replacement

Outline

Replacement

VH cleaner assembly removal
AHC roller assembly replacement
VH cleaner assembly reinstallation
Operation check

Precautions

- The video head cleaner can be replaced with the cassette compartment attached.
- The following new CR cap is required when replacing the video head cleaner.
  CR cap : 3-615-320-01

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)

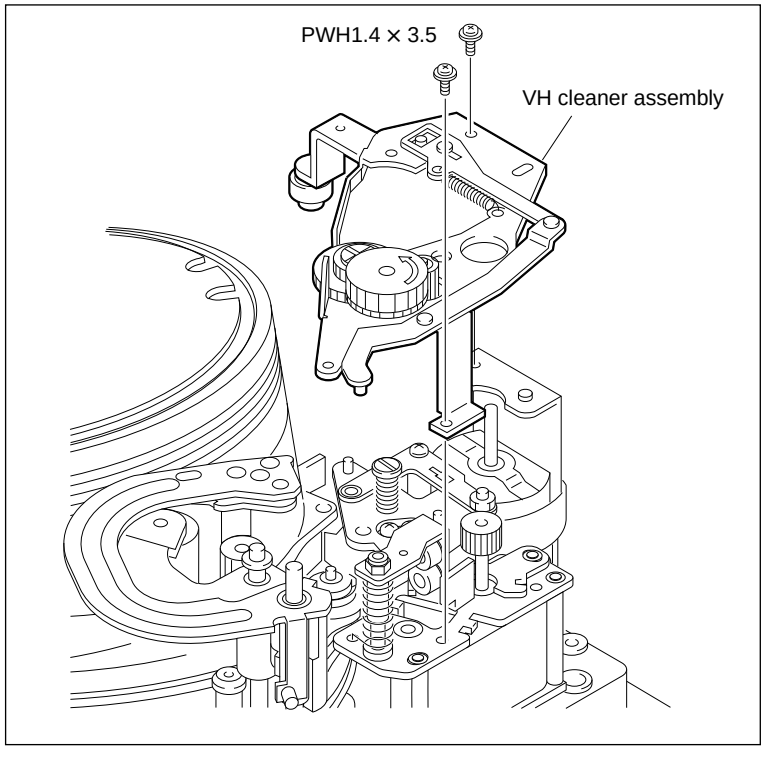
Tools

- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

Replacement

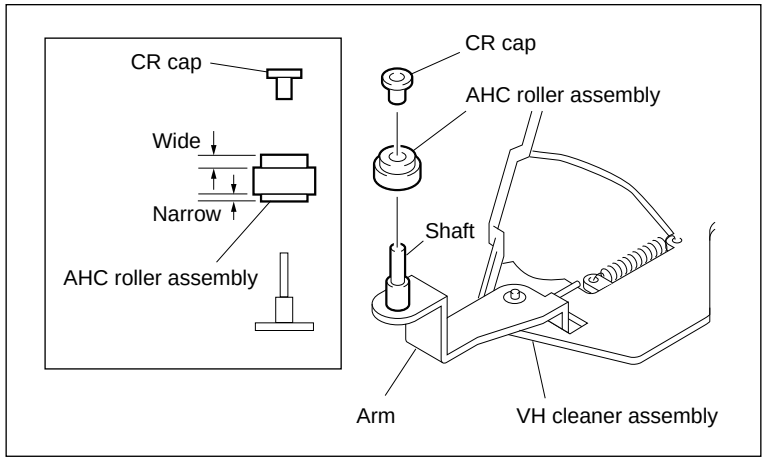
1. VH cleaner assembly removal

Remove the two screws to remove the VH cleaner assembly.



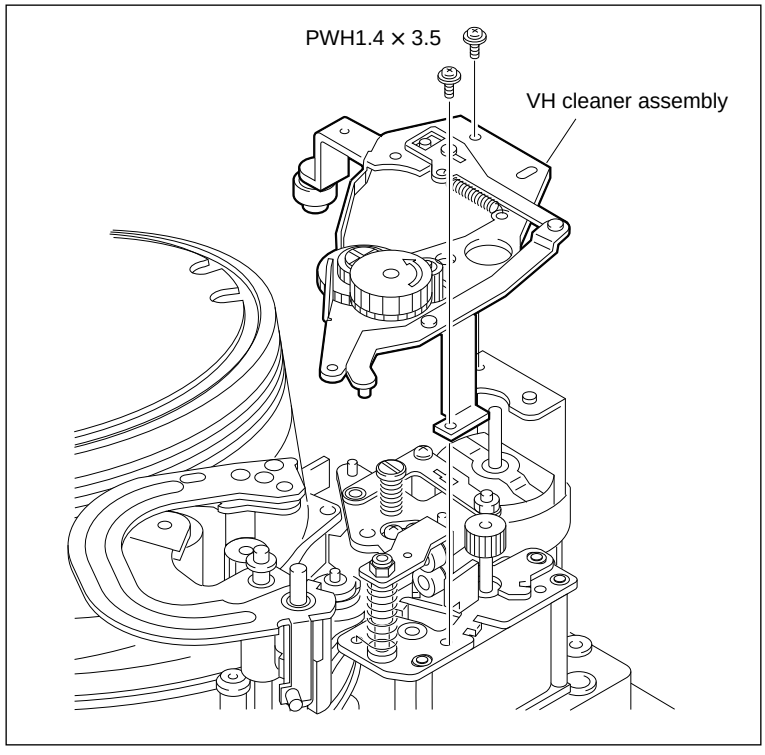
2. AHC roller assembly replacement

(1) Pull the CR cap out and extract the AHC roller assembly.
(2) Put a new AHC roller assembly into the shaft in the direction indicated by the figure.
(3) Attach a new CR cap and push the cap firmly as far as it will go while supporting the arm by finger.

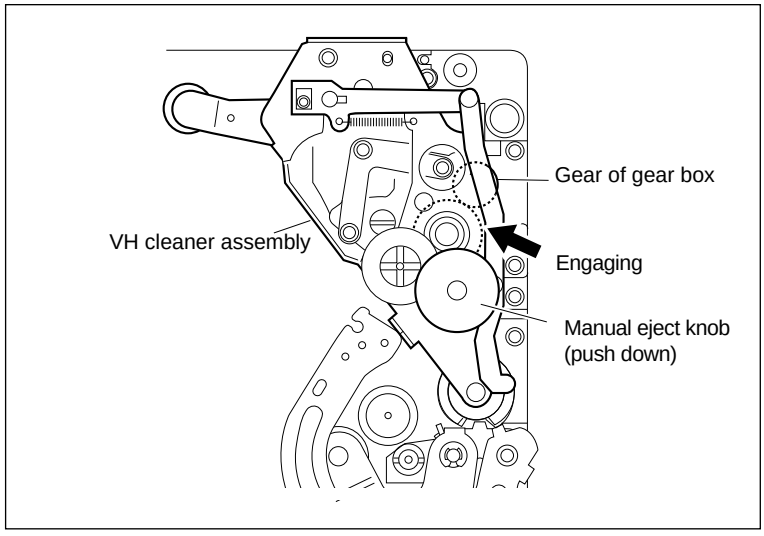


3. VH cleaner assembly reinstallation

(1) Reattach the VH cleaner assembly with the two screws.
Tightening torque: 9×10^{-2} N•m
{0.9 kgf•cm}



(2) Check to see that the gear of the VH cleaner assembly is engaged with the gear of the gear box when the manual eject knob is pushed down.



4. Operation check

Check that the AHC roller assembly contacts to the drum, or releases from the drum when turning the manual eject knob clockwise and counter-clockwise.

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5-7. Pinch Roller Replacement

Outline

Replacement

T drawer sub assembly removal
Pinch roller replacement
T drawer sub assembly reinstallation
Cleaning
Operation check

Adjustment after replacement

Tape running adjustment

Precaution

The following new E ring is required when replacing the pinch roller.
E ring (2.3) : 7-624-105-04

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

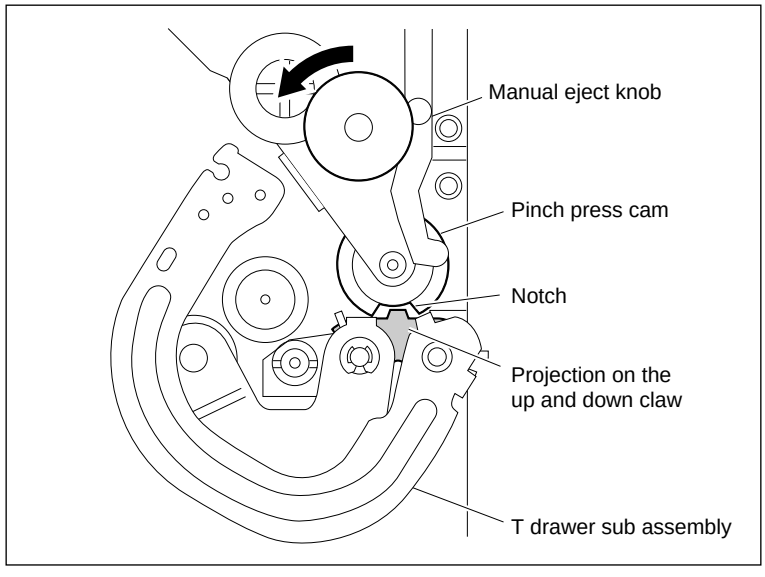
Tools

- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Oil : 7-611-018-18

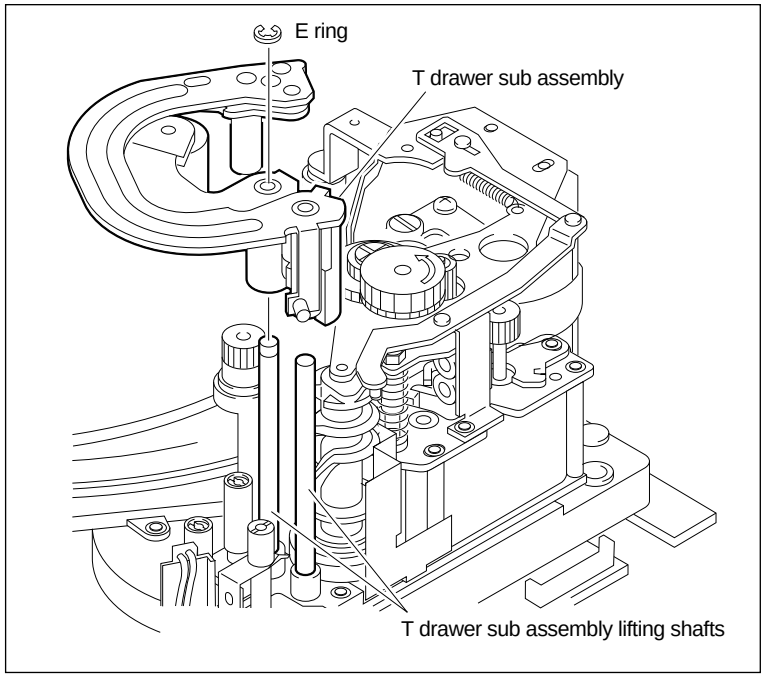
Replacement

1. T drawer sub assembly removal

(1) Turn the manual eject knob counterclockwise while pressing down so that the notch of the pinch press cam fits with the projection on the up and down claw of the T drawer sub assembly.

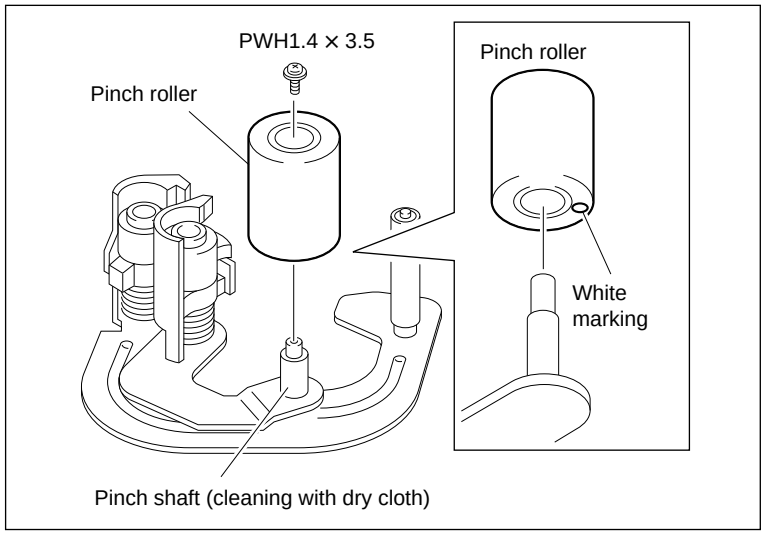


(2) Remove the E ring of the T drawer sub assembly lifting shaft with tweezers.
(3) Lift the T drawer sub assembly out just above from the shafts.



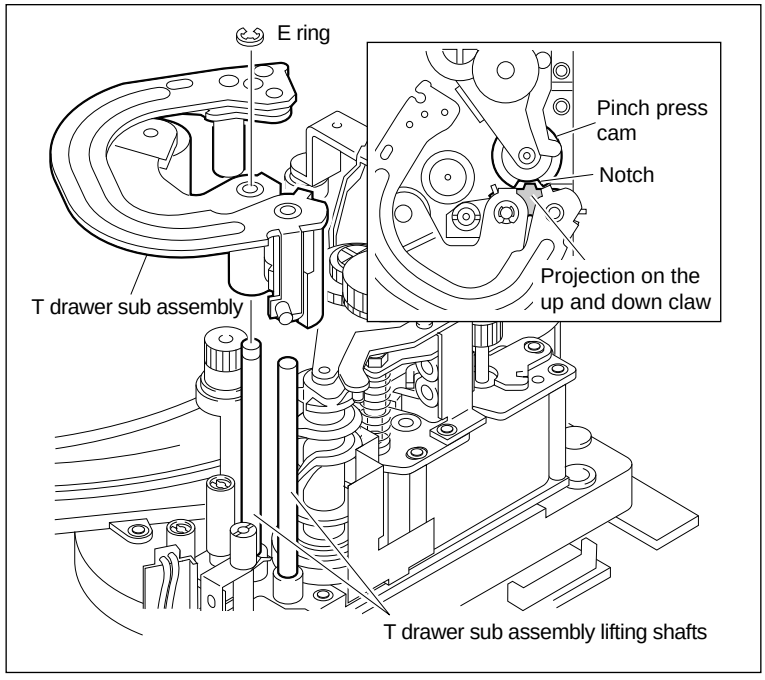
2. Pinch roller replacement

(1) Remove the one screw to remove the pinch roller.
(2) Wipe the pinch shaft with a dry soft-cloth.
(3) Attach a new pinch roller into the pinch shaft in the direction indicated by the figure and fix it with the screw.
Tightening torque: 9×10^{-2} N•m
{0.9 kgf•cm}



3. T drawer sub assembly reinstallation

(1) Wipe the T drawer sub assembly lifting shafts with a cleaning cloth moistened with a cleaning fluid.
(2) Apply a quarter drop of oil to the shafts.
(3) Put the holes of the T drawer sub assembly into the T drawer sub assembly lifting shafts while putting the projection on the up and down claw of the T drawer sub assembly into the notch of the pinch press cam.
(4) Install a new E ring to the T drawer sub assembly lifting shaft.



4. Cleaning

Clean the surface of the pinch roller and T3 tape guide with cleaning cloth moistened with cleaning fluid. (Refer to Section 4-2-6.)

5. Operation check

Check that the pinch roller is engaged to the capstan shaft when the unit is in the threading end state.

Adjustment after replacement

6. Tape running adjustment

(Refer to Section 7-4.)

5-8. Swing Gear Replacement

Outline

Replacement

Timing belt removal
Swing gear replacement
Timing belt reinstallation

Adjustment after replacement

Tape running adjustment

Precautions

- The mechanical deck assembly should be removed from the unit when the swing gear is replaced. Be careful not to damage the video heads, drum, and other parts during removal.
- The following new stop washer is required when replacing the swing gear.
  Stop washer (ø2.5) : 3-315-384-11

Preparations

1. Turn off the power.
2. Remove the mechanical deck assembly. (Refer to Section 5-1-6.)

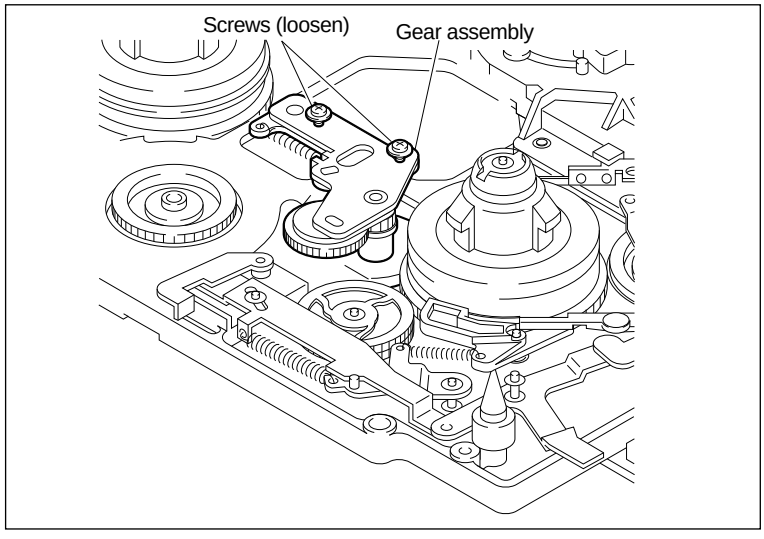
Tools

- Hexagon bit (Across flat has 1.5 mm) : J-6326-120-A
- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Stop washer fastening tool : J-6323-530-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01

Removal

1. Timing belt removal

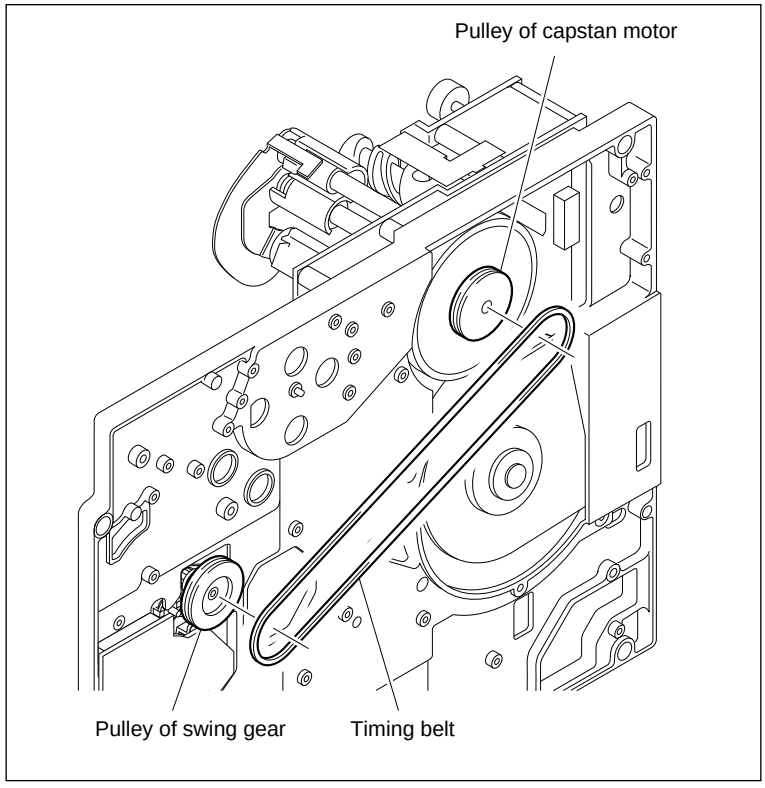
(1) Loosen the two screws shown in the figure of the gear assembly by one half to one turn.



(2) Remove the timing belt from the pulleys on the back of the mechanical deck.

Note

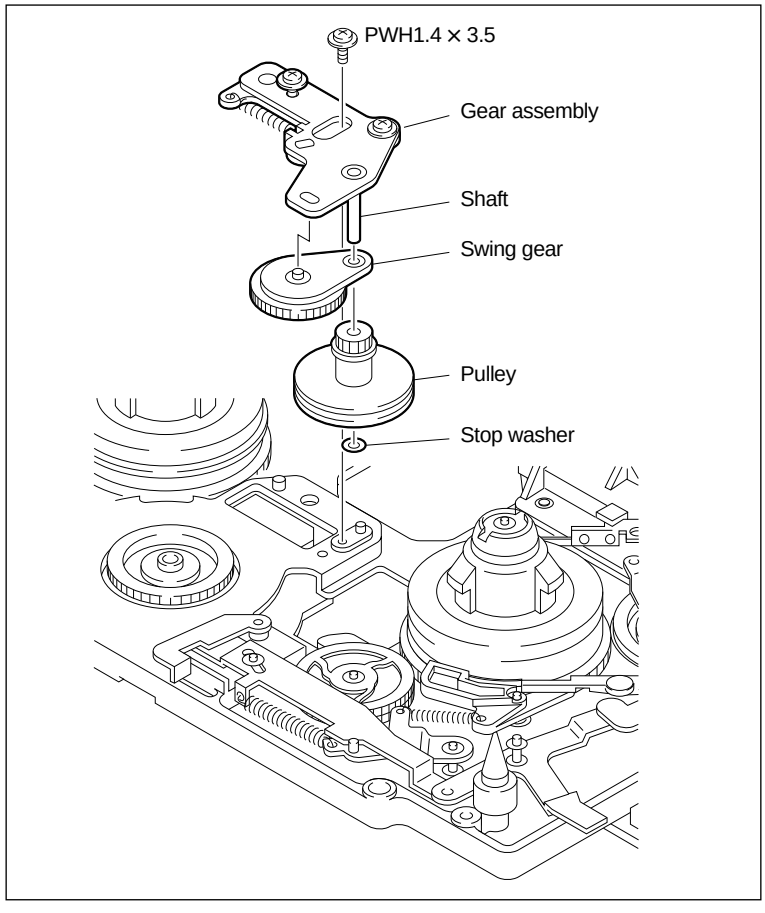
Be careful not to stretch or bend the removed timing belt.



Installation

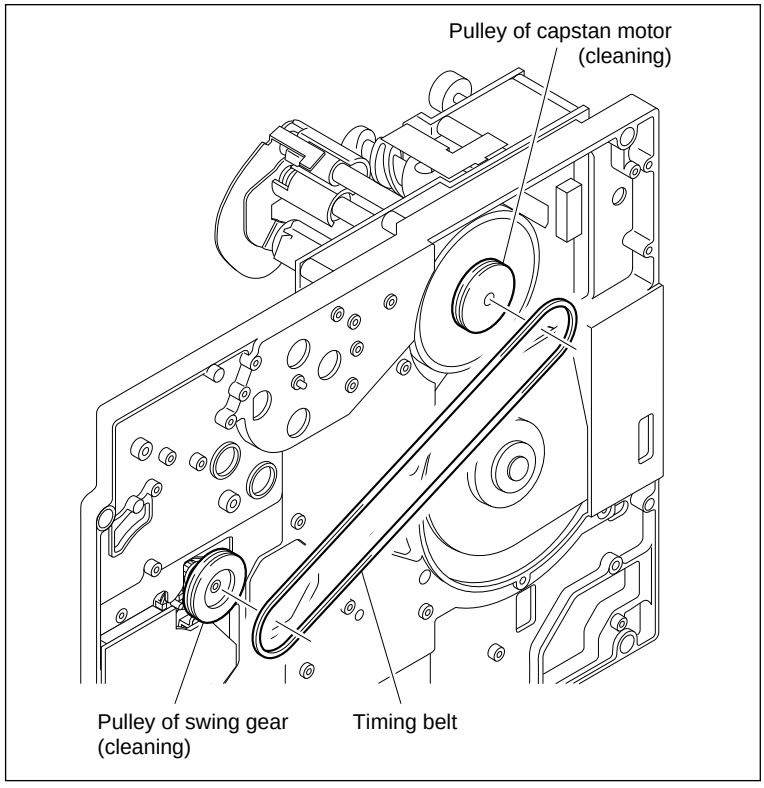
2. Swing gear replacement

(1) Remove the screw to remove the gear assembly from the mechanical deck.
(2) Remove the stop washer, and then pull out the swing gear and pulley.
(3) Clean the shaft of the gear assembly with a dry soft-cloth.
(4) Apply one half of oil to the shaft of the gear assembly.
(5) Insert the shaft of the gear assembly into the hole of the new swing gear.
(6) Insert the shaft of the gear assembly into the hole of the pulley removed in step (2), and then fasten them using a new stop washer.
(7) Attach the gear assembly onto the mechanical deck with the screw.
Tightening torque : 9×10^{-2} N•m
{0.9 kgf•cm}



3. Timing belt reinstallation

(1) Wipe the pulleys of the swing gear and capstan motor with a cleaning cloth moistened with a cleaning fluid.
(2) Loop the timing belt removed in procedure 1 over the pulley of the swing gear .
(3) Loop the other end of the timing belt over the pulley of the capstan motor.

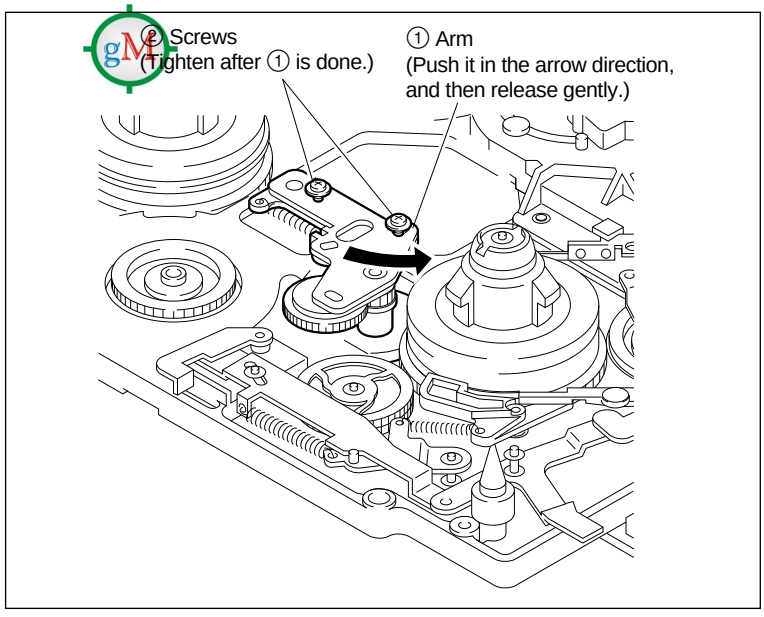


(4) Move the arm of the gear assembly in the direction indicated by the arrow with fingers, and then release it gently. The arm of the gear assembly slightly returns in the clockwise direction by spring force.
(5) Tighten the two screws loosened in step (1) of procedure 1. At that time, do not hold the arm of the gear assembly with fingers.
Tightening torque: 9×10^{-2} N•m
{0.9 kgf•cm}

Note

The tension of the timing belt is adjusted by performing steps (4) and (5).

(6) Apply locking compound to the screws after tightening in step (5). When applying, avoid the slot of the screw.



Adjustment after replacement

4. Tape running adjustment

(Refer to Section 7-4.)

5-9. Tension Regulator Band Replacement

Outline

Replacement

T tension regulator arm assembly removal
Tension regulator band removal
Tension regulator band installation
T tension regulator arm assembly reinstallation

Adjustment after replacement

Tape running adjustment
REV back tension adjustment

Precaution

The following new stop washer is required when replacing the tension regulator band.
Stop washer (ø3.6) : 3-559-408-11

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

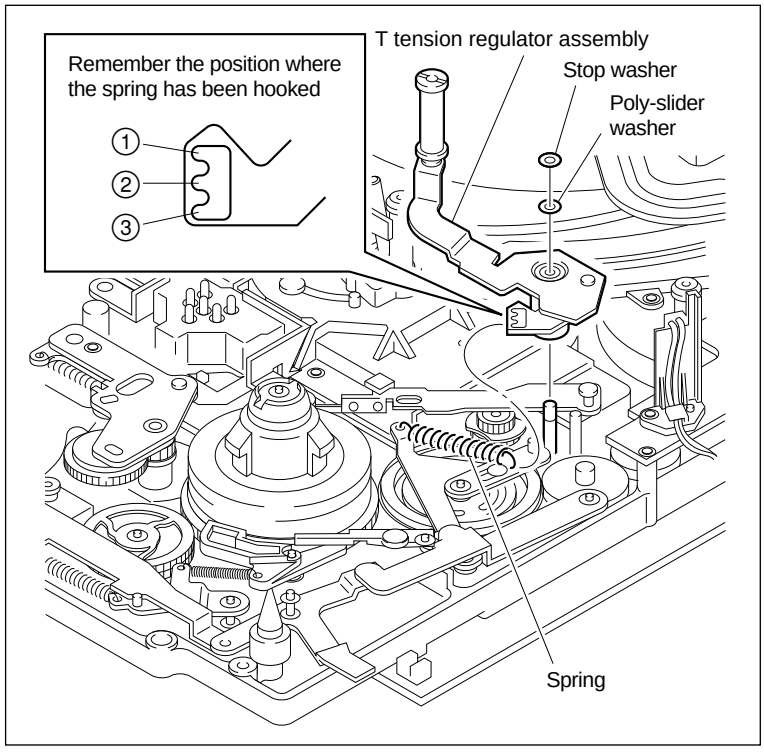
- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Stop washer fastening tool : J-6323-530-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01

Removal

1. T tension regulator arm assembly removal

(1) Unhook the spring of the T tension regulator arm assembly shown in the figure. At that time, be sure to remember the position where the spring has been hooked.

(2) Remove the stop washer and poly-slider washer to remove the T tension regulator arm assembly.



2. Tension regulator band removal

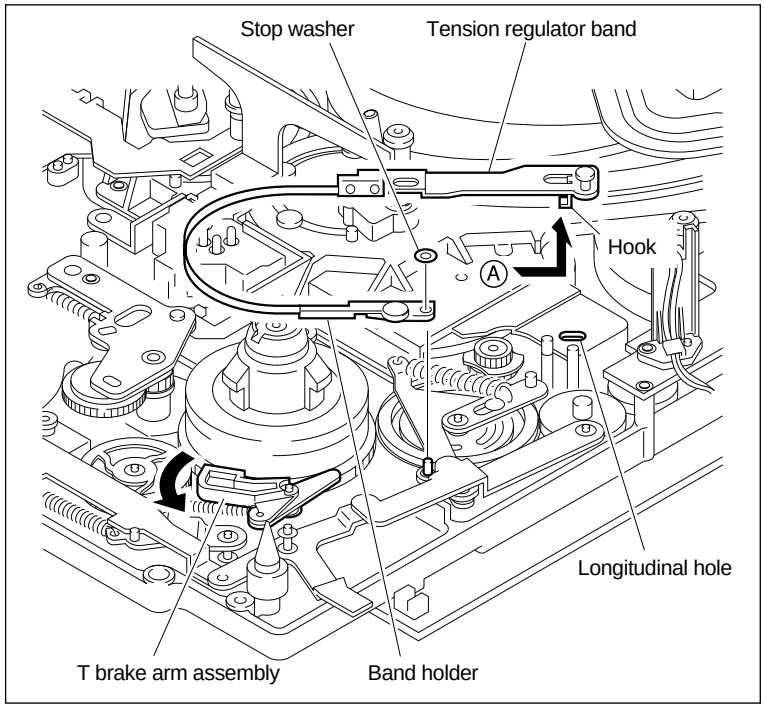
(1) Remove the stop washer as shown in the figure.

(2) Remove the band holder from the shaft of the band adjustment bracket while releasing the T brake arm with fingers.

Note

When releasing the T brake arm, do not give a excessive force to it.

(3) Move the tension regulator band in the direction indicated by arrow A, remove the hook from the longitudinal hole of the T rail to remove the tension regulator band.



Installation

Note

Be careful not to bend or stain the tension regulator band.

3. Tension regulator band installation

(1) Clean the surface of the T reel table, that the tension regulator band contact, with a cleaning cloth moistened with a cleaning fluid.

(2) Put the hook of a new tension regulator band into the longitudinal hole on the T rail.

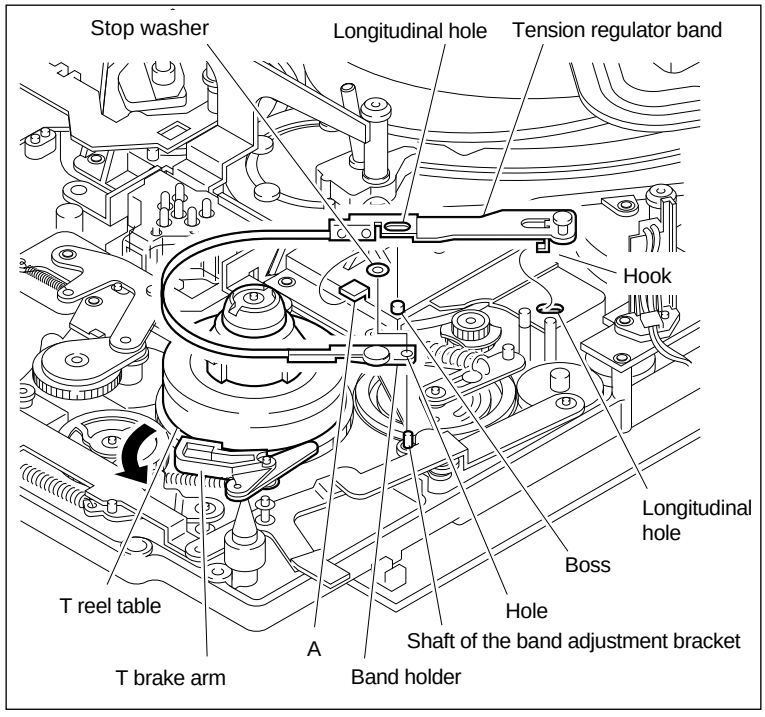
(3) Put the longitudinal hole of the tension regulator band to the boss on the T rail. At that time, make sure that the tension regulator band is passed under the portion A of the T rail.

(4) Attach the tension regulator band around the T reel table while releasing the T brake arm with fingers.

Note

When releasing the brake arm, do not give a excessive force to it.

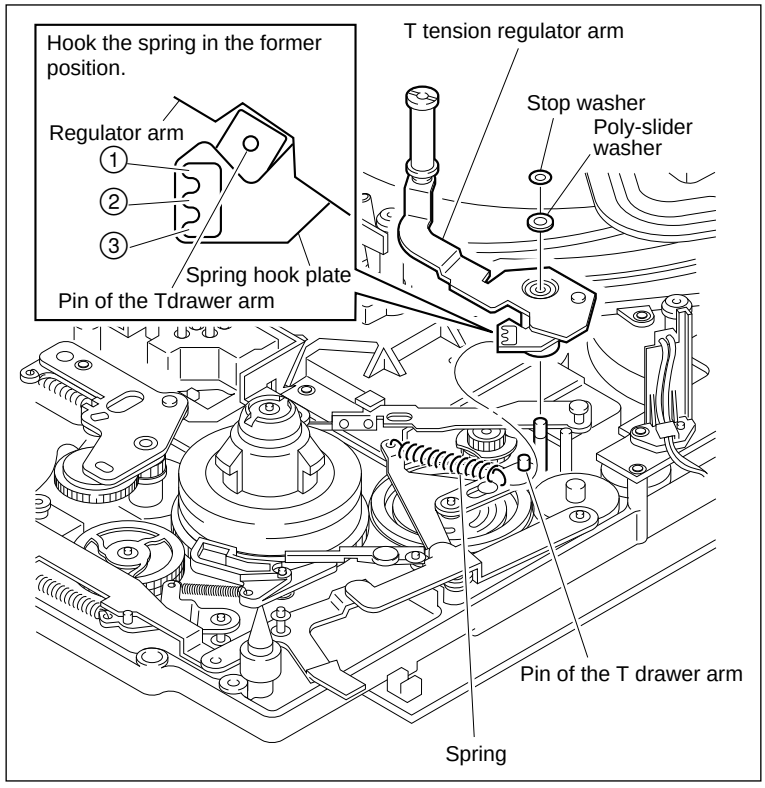
(5) Put the hole of the band holder onto the shaft of the band adjustment bracket and fasten it using a new stop washer.



4. T tension regulator arm assembly reinstallation

(1) Put the T tension regulator arm assembly onto the shaft of the mechanical deck so that pin of the T drawer arm is put between the spring hook plate and regulator arm of the T tension regulator arm assembly as shown in the figure, then attach a poly-slider washer, and fasten them using a new stop washer.

(2) Hook the spring removed in step (1) of procedure 1 back in the original position.



Adjustment after replacement

5. Tape running adjustment

(Refer to Section 7-4.)

6. REV back tension adjustment

(Refer to Section 7-3-2.)

5-10. Timing Belt Replacement

Outline

Replacement

Timing belt removal
Timing belt installation

Adjustment after replacement

Tape running adjustment

Precaution

Remove the mechanical deck assembly from the unit when the timing belt is replaced. Be careful not to damage the video heads, drum, and other parts during removal.

Preparations

1. Turn off the power.
2. Remove the mechanical deck assembly. (Refer to Section 5-1-6.)

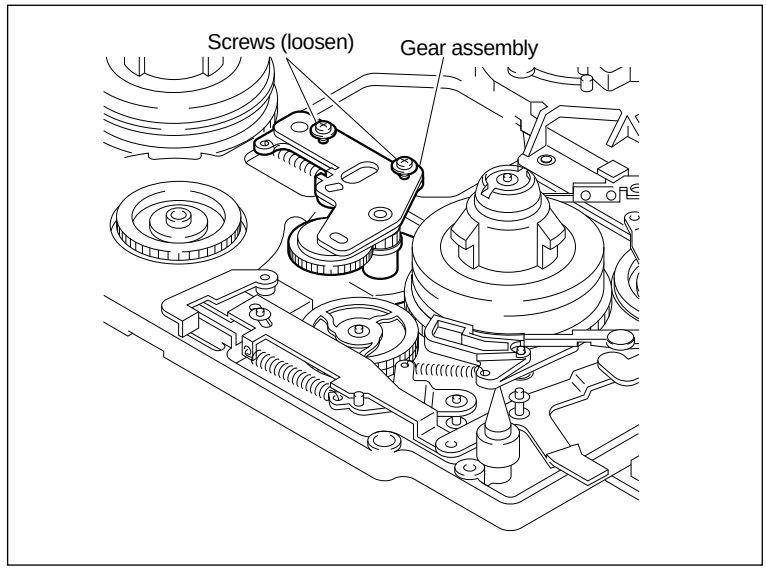
Tools

- Hexagon bit (Across flat has 1.5 mm) : J-6326-120-A
- Torque screwdriver bit (for M1.4) : J-6325-110-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01

Removal

1. Timing belt removal

(1) Loosen the two screws shown in the figure of the gear assembly by one half to one turn.



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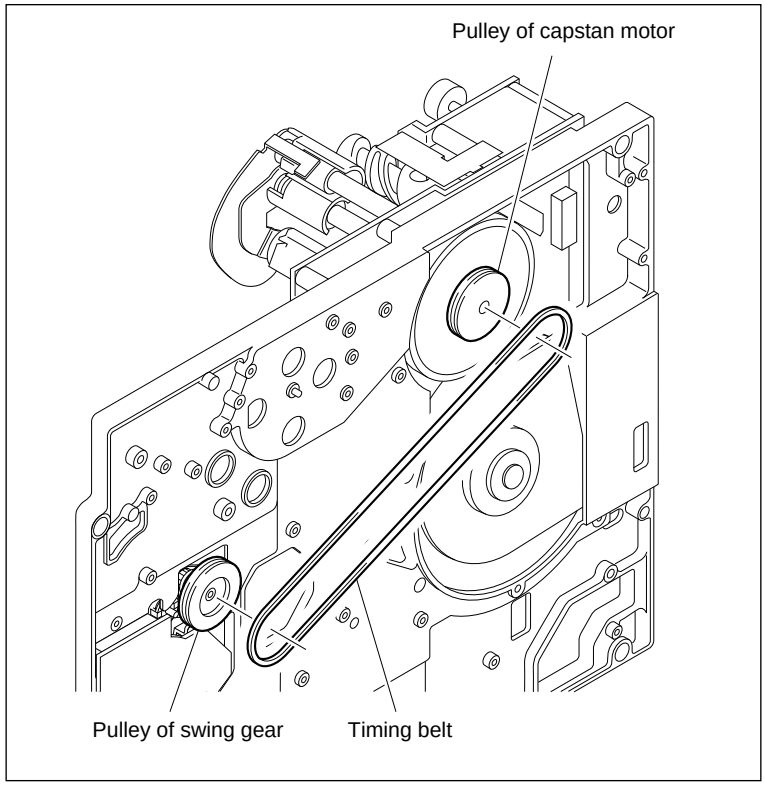
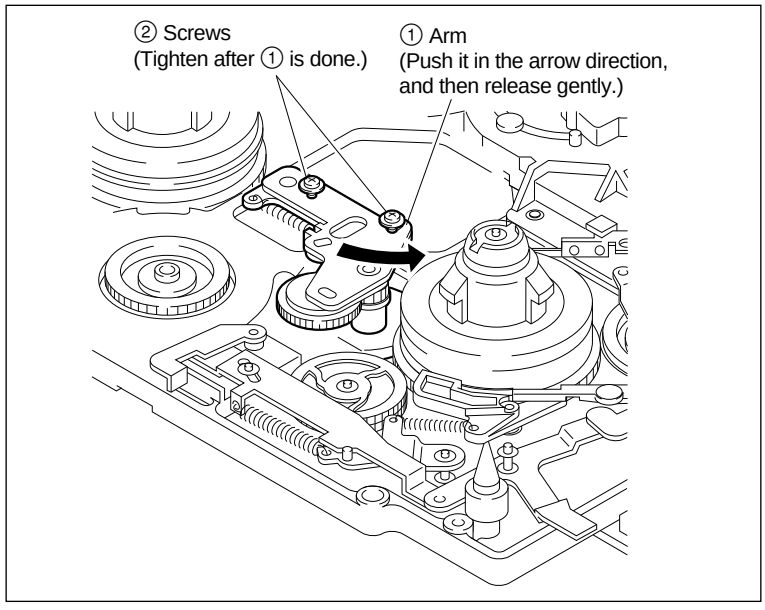
(2) Remove the timing belt from the pulleys on the back of the mechanical deck.



Installation

2. Timing belt installation

(1) Clean the pulleys of the swing gear and capstan motor with cleaning cloth moistened with cleaning fluid.
(2) Loop a new timing belt over the pulley of the swing gear.
(3) Loop the other end of the timing belt over the pulley of the capstan motor.



(4) Move the arm of the gear assembly in the direction indicated by the arrow with fingers, and then release it gently. The arm of the gear assembly slightly returns in the clockwise direction by spring force.
(5) Tighten the two screws loosened in step (1) of procedure 1. At that time, do not hold the arm of the gear assembly with fingers.
Tightening torque : 9×10^{-2} N•m
{0.9 kgf•cm}

Reference

The tension of the timing belt is adjusted by performing steps (4) and (5).

(6) Apply locking compound to the screws after tightening in step (5). When applying, avoid the slot of the screw.

Adjustment after replacement

3. Tape running adjustment

(Refer to Section 7-4.)

5-11. S Main Brake Shoe Replacement

Outline

Replacement

S brake assembly removal
Brake shoe replacement
S brake assembly reinstallation
Operation check

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

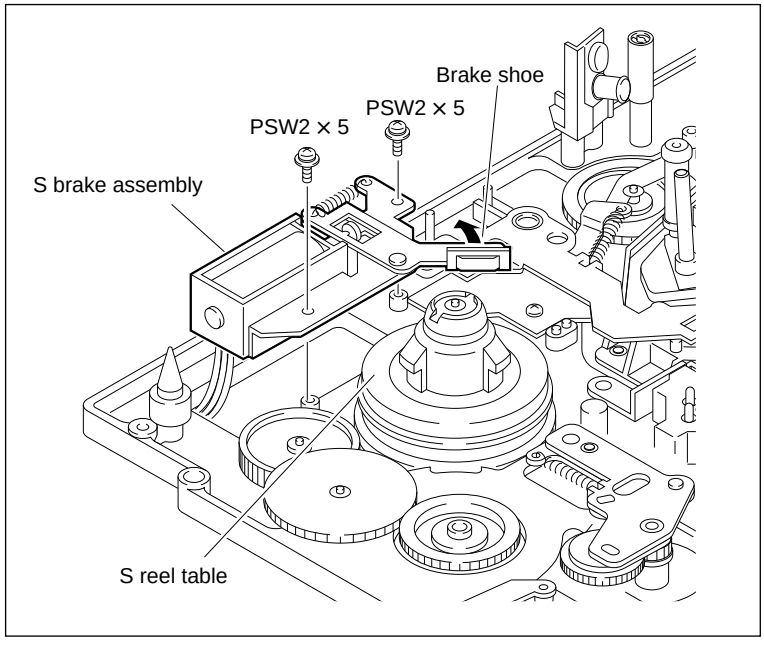
Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Cutter knife
- Tweezers

Replacement

1. S brake assembly removal

(1) Remove the two screws.
(2) While releasing the brake shoe from the S reel table, remove the S brake assembly.



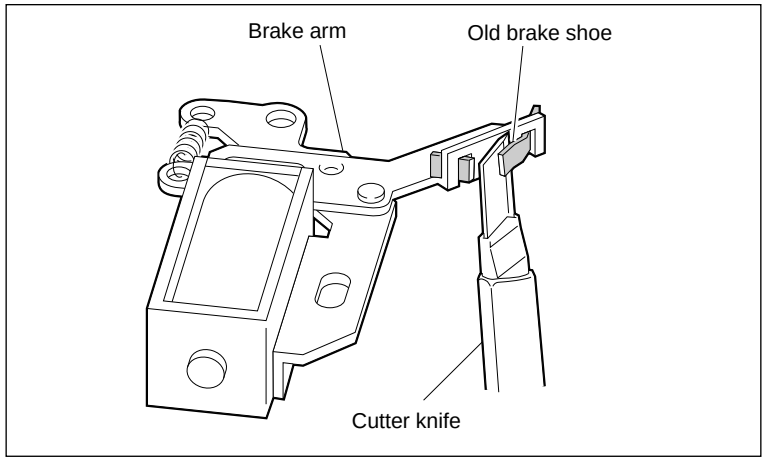
2. Brake shoe replacement

(1) Tear off the old brake shoe from the brake arm.

Note

Remove the glue glops of the old brake shoe completely from the brake arm using a cutter knife.

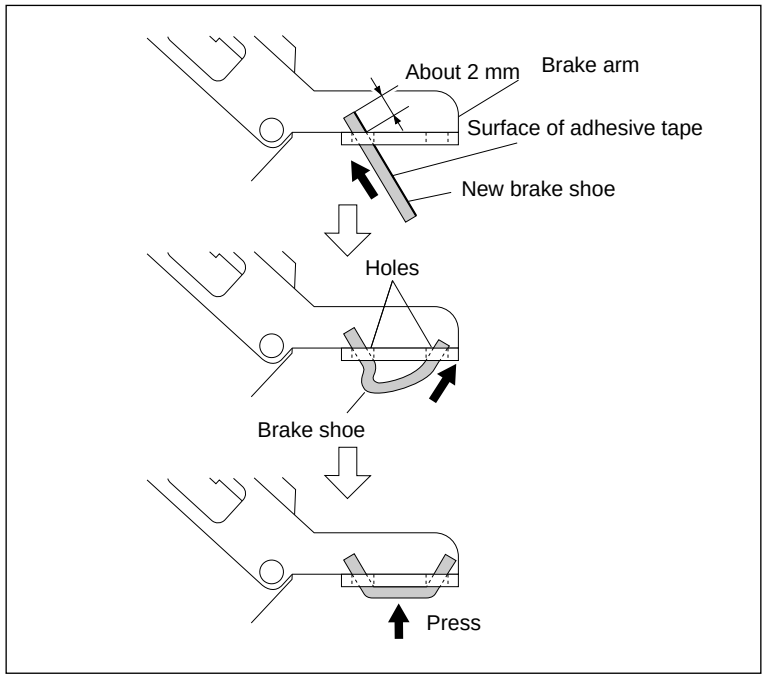
Pay careful attention when handling the cutter knife.



(2) Hold a new brake shoe using tweezers, and then pass the end of the brake shoe through the hole of the brake arm as shown in the figure.

(3) Pass the other end of the brake shoe through the hole of the brake arm.

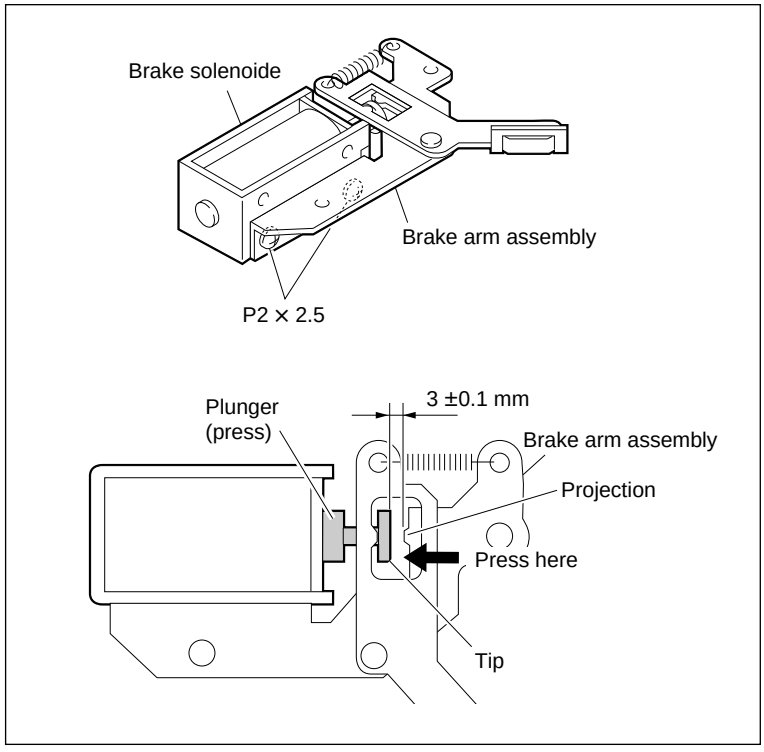
(4) Being careful not to bend the brake shoe, attach the brake shoe to the brake arm.



3. S brake assembly reinstallation

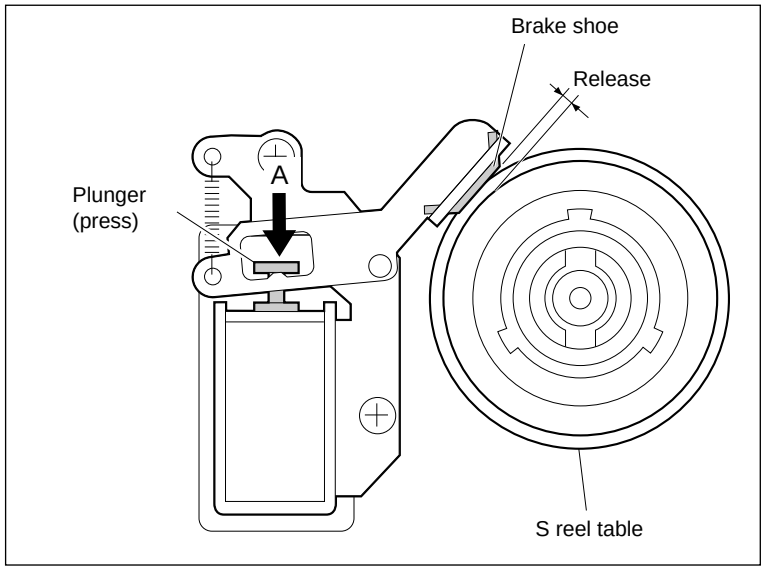
(1) Make sure that the clearance between the tip of the plunger and the projection of the brake arm assembly meets the specification (3.0 ±0.1 mm) when pressing the plunger in the direction of the arrow by finger.
If not, loosen the two screws and adjust the position of the solenoid.
Tightening torque : 20×10^{-2} N•m {2.0 kgf•cm}

(2) Reattach the S brake assembly on the mechanical deck with the two screws.
Tightening torque : 20×10^{-2} N•m {2.0 kgf•cm}



4. Operation check

Check that the brake shoe is released from the S reel table when the plunger of the brake solenoid is pushed in the energized direction (arrow A).



5-12. Capstan Motor Replacement

Outline

Replacement

VH cleaner assembly removal
Timing belt removal
T drawer sub assembly removal
Capstan motor removal
Capstan motor installation
T drawer sub assembly reinstallation
Timing belt reinstallation
VH cleaner assembly reinstallation
Cleaning

Adjustment after replacement

CAPSTAN FG DUTY adjustment
CAPSTAN FRICTION adjustment
CAPSTAN FREE SPEED adjustment
Tape running adjustment
Video tracking check

Precaution

Remove the mechanical deck assembly from the unit when replacing the capstan motor. Be careful not to damage the video heads, drum, and other parts during removal.

Preparations

1. Turn off the power.
2. Remove the mechanical deck assembly. (Refer to Section 5-1-6.)

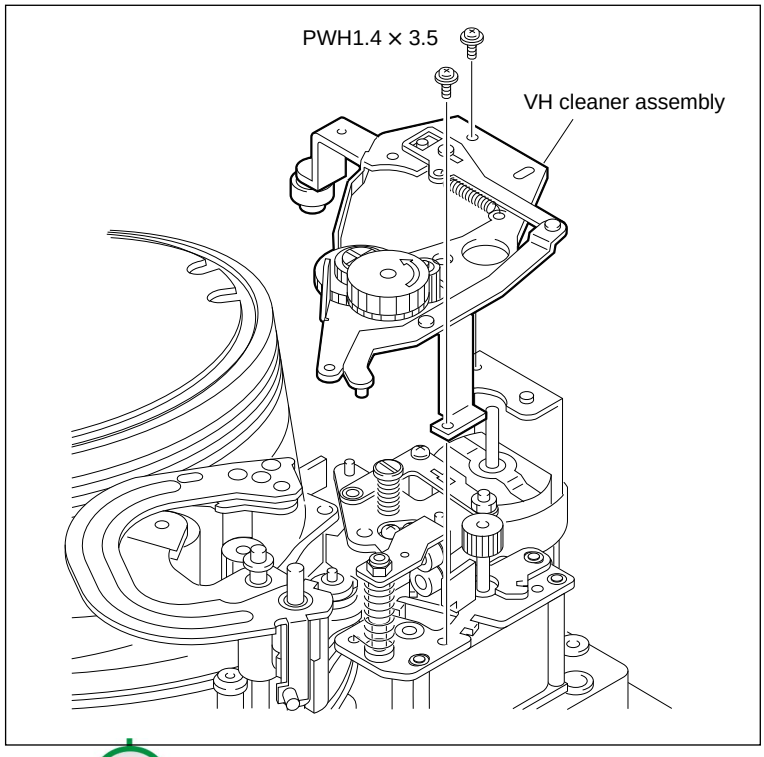
Tools

- Hexagon bit (Across flat has 1.5 mm) : J-6326-120-A
- Torque screwdriver’s bit (for M1.4) : J-6325-110-A
- Torque screwdriver’s bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01

Removal

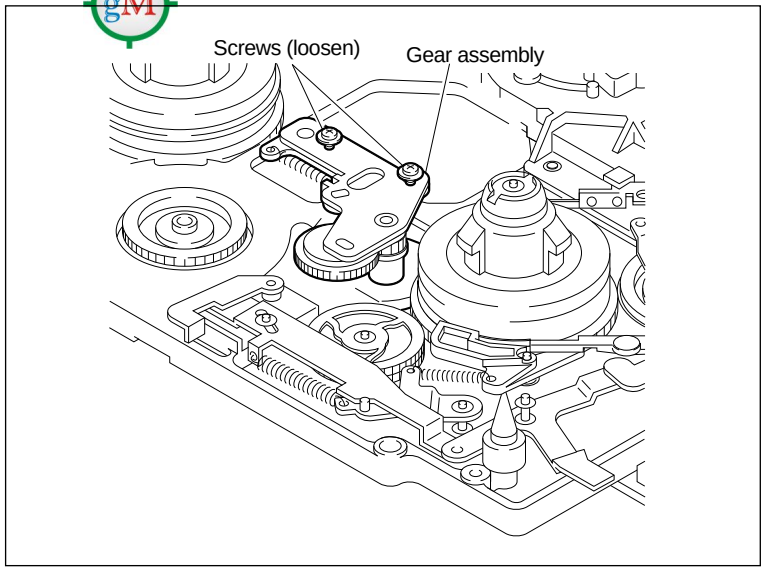
1. VH cleaner assembly removal

Remove the two screws to remove the VH cleaner assembly.



2. Timing belt removal

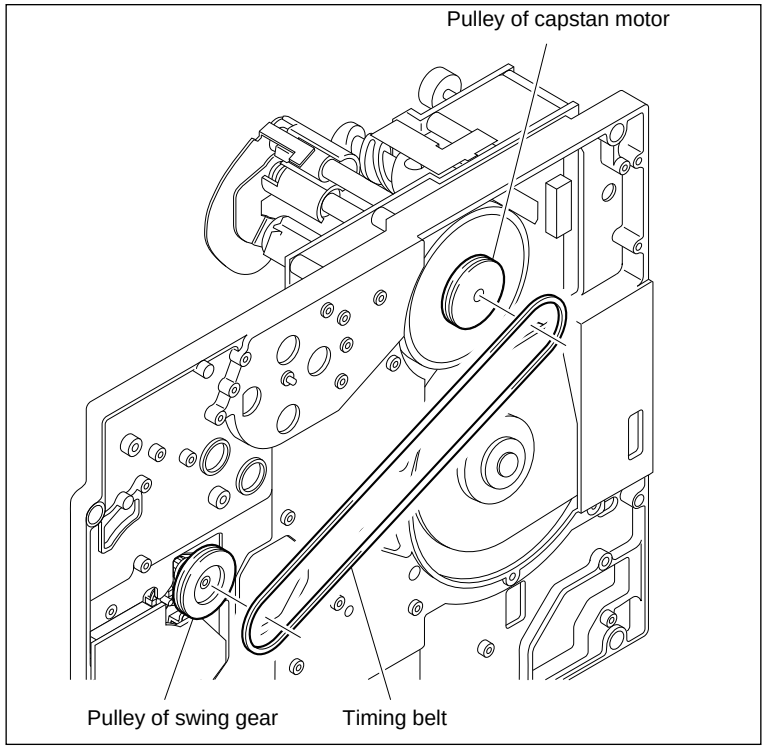
(1) Loosen the two screws shown in the figure of the gear assembly by one half to one turn.



(2) Remove the timing belt from the pulleys on the back of the mechanical deck.

Note

Be careful not to stretch or bend the removed timing belt.

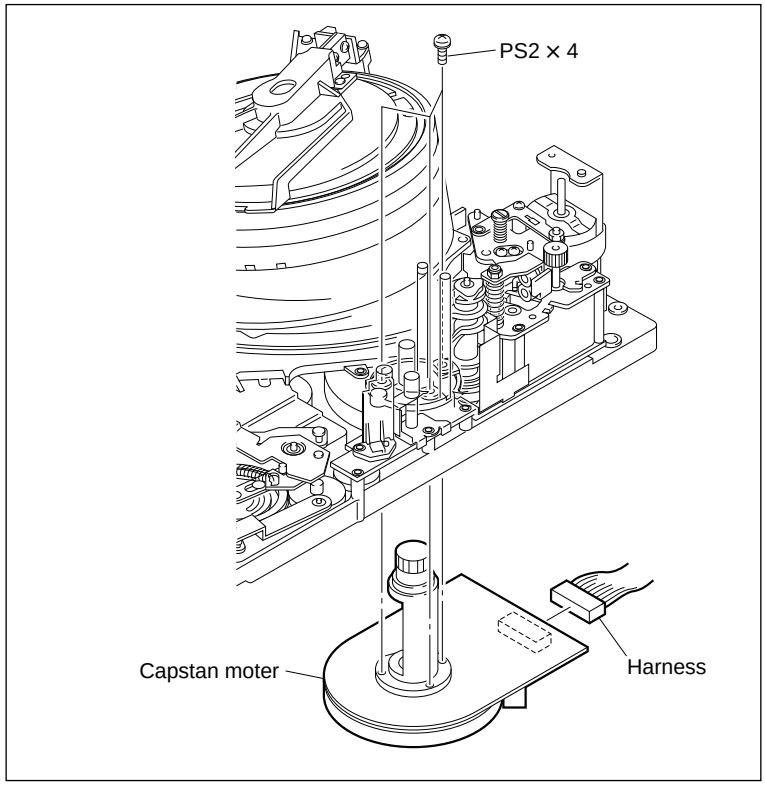


3. T drawer sub assembly removal

Remove the T drawer sub assembly.
(Refer to Section 5-7.)

4. Capstan motor removal

(1) Disconnect the harness connected to the board of the capstan motor. Be careful not to lose the harness because it is used again.
(2) Remove the three screws at the top of the mechanical deck while holding the capstan motor from the back side of the mechanical deck assembly by hand.
(3) Remove the capstan motor from the back of the mechanical deck assembly.



Installation

5. Capstan motor installation

(1) Slide a new capstan motor into the hole of the mechanical deck assembly in the direction indicated by the figure, and then fix it with the three screws.
Tightening torque : 20×10^{-2} N•m
{2.0 kgf•cm}

Note

Be careful not to damage the capstan shaft when sliding the new capstan motor into the hole of the mechanical deck assembly.

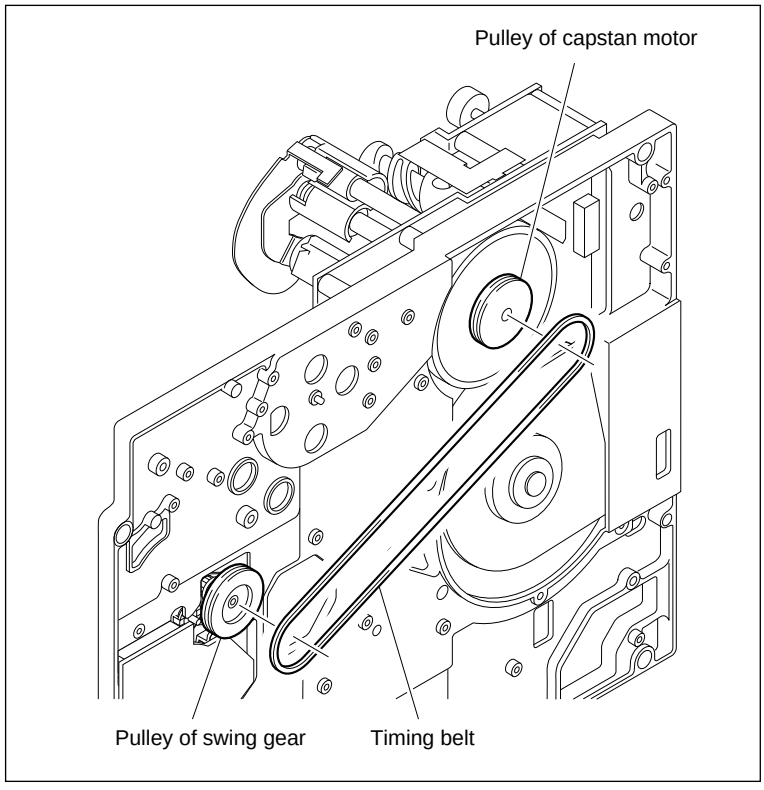
(2) Connect the harness to the board of the capstan motor.

6. T drawer sub assembly reinstallation

Reattach the T drawer sub assembly.
(Refer to Section 5-7.)

7. Timing belt reinstallation

(1) Clean the pulleys of the swing gear and capstan motor with a cleaning cloth moistened with a cleaning fluid.
(2) Loop the timing belt removed in procedure 2 over the pulley of the swing gear .
(3) Loop the other end of the timing belt over the pulley of the capstan motor.

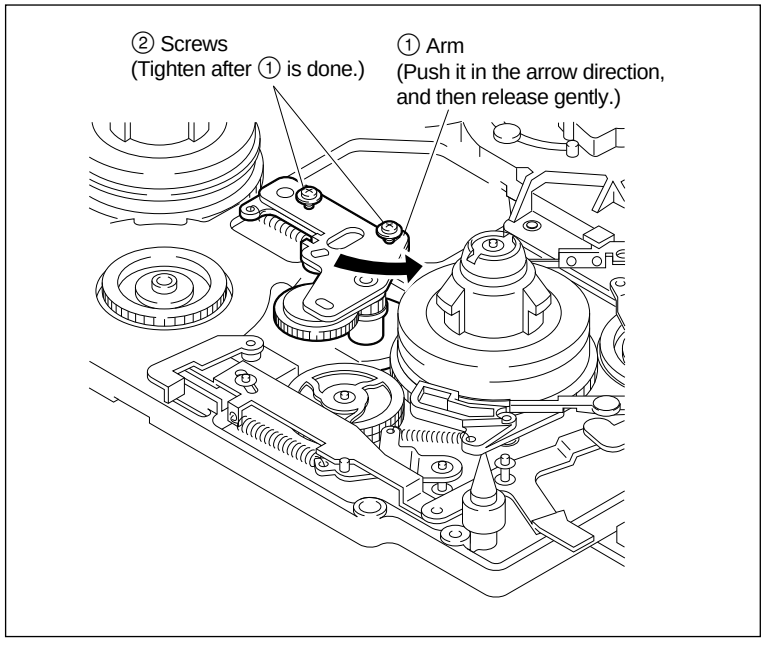


(4) More the arm of the gear assembly in the direction indicated by the arrow with finger, and then release it gently. The arm of the gear assembly slightly returns in the clockwise direction by spring force.
(5) Tighten the two screws loosened in step (1) of procedure 2. At that time, do not hold the arm of the gear assembly with fingers.

Reference

The tension of the timing belt is adjusted by performing steps (4) and (5).

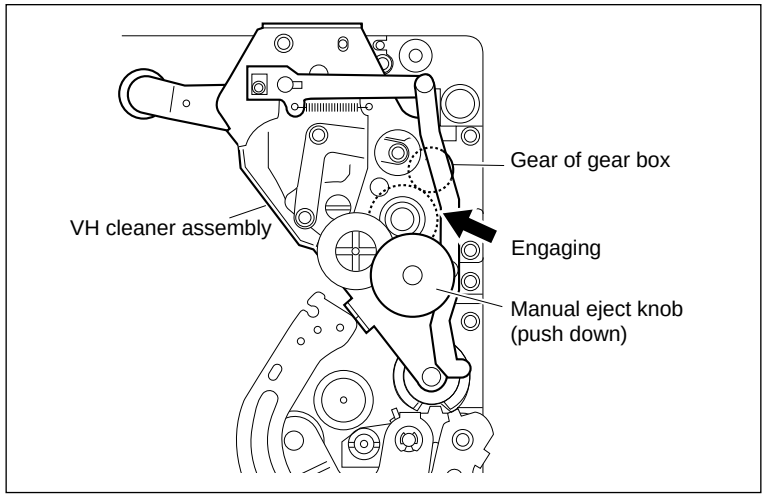
(6) Apply locking compound to the screws after tightened in step (5). When applying, avoid the slot of the screw.



8. VH cleaner assembly reinstallation

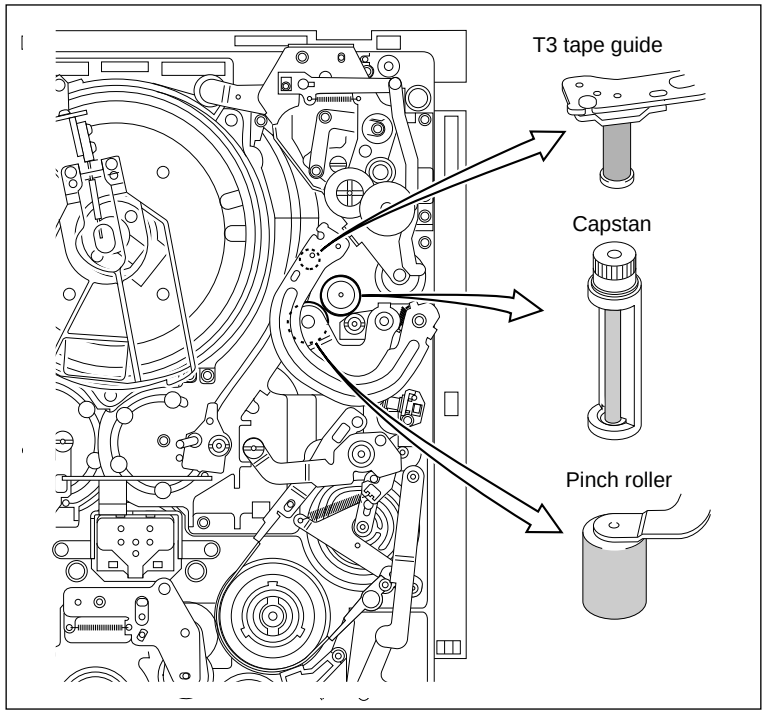
(1) Reattach the VH cleaner assembly with the two screws.
Tightening torque : 9×10^{-2} N•m
{0.9 kgf•cm}

(2) Check to see that the gear of the VH cleaner assembly is engaged with the gear of the gear box when pushing down the manual eject knob.



9. Cleaning

Clean the surfaces of the capstan motor's shaft, T3 guide, and pinch roller with a cleaning cloth moistened with a cleaning fluid.



Adjustment after replacement

10. CAPSTAN FG DUTY adjustment

(Refer to Section 3-2-6.)
(A002 : CAPSTAN FG DUTY)

11. CAPSTAN FRICTION adjustment

(Refer to Section 3-2-6.)
(A003 : CAPSTAN FRICTION)

12. CAPSTAN FREE SPEED adjustment

(Refer to Section 3-2-6.)
(A004 : CAPSTAN FREE SPEED)

13. Tape running adjustment

(Refer to Section 7-4.)

14. Video tracking check

(Refer to Section 7-5.)

5-13. S Reel Motor Replacement

Outline

Replacement

S reel motor removal
S reel motor installation

Adjustment after replacement

S REEL FG DUTY adjustment
Tape running adjustment

Precaution

Remove the mechanical deck assembly from the unit when replacing the S reel motor. Be careful not to damage the video heads, drum, and other parts during removal.

Preparations

1. Turn off the power.
2. Remove the mechanical deck. (Refer to Section 5-1-6.)

Tools

- Hexagon bit (Across flat has 1.5 mm) : J-6326-120-A
- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

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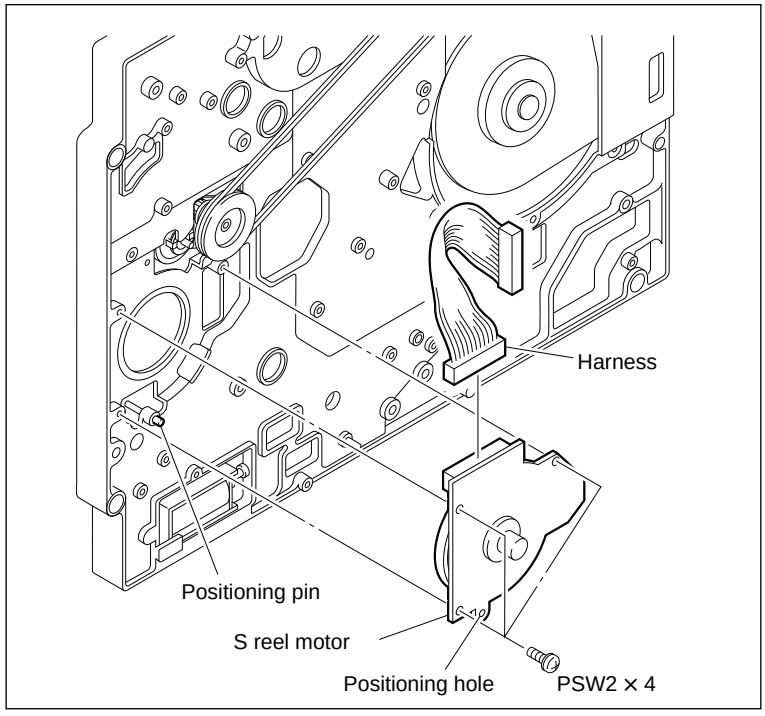
Removal

1. S reel motor removal

(1) Remove the three screws to remove the S reel motor.
(2) Disconnect the harness from the board of the S reel motor. Be careful not to lose the harness because it is used again.



Installation

2. S reel motor installation

(1) Connect the harness removed in step (2) of procedure 1 to the board of a new S reel motor.
(2) Align the positioning hole of the S reel motor's board with the positioning pin on the mechanical deck, and then secure it with the three screws.
Tightening torque : 20×10^{-2} N•m
{2.0 kgf•cm}

Adjustment after replacement

3. S REEL FG DUTY adjustment

(Refer to Section 3-2-6.)
(A001 : S REEL DUTY)

4. Tape running adjustment

(Refer to Section 7-4.)

5-14. Tension Spring Replacement

Outline

Replacement

T drawer sub assembly removal
Tension spring removal
T drawer arm removal
Tension spring installation
T drawer sub assembly reinstallation

Adjustment after replacement

Operation check

Precautions

- When replacing the tension spring, do not stretch the tension spring.
  Be sure to install the hook of the tension spring to the appointed direction. If the tension spring is stretched or the hook is installed in the incorrect direction, the life of the tension spring will be shortened.
- When replacing, be careful not to bend the T drawer arm and to slant the tape guide by applying the force to the T drawer arm and tape guide.
- The following new E ring is required when replacing the tension spring.
  E ring : 7-624-105-04

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)

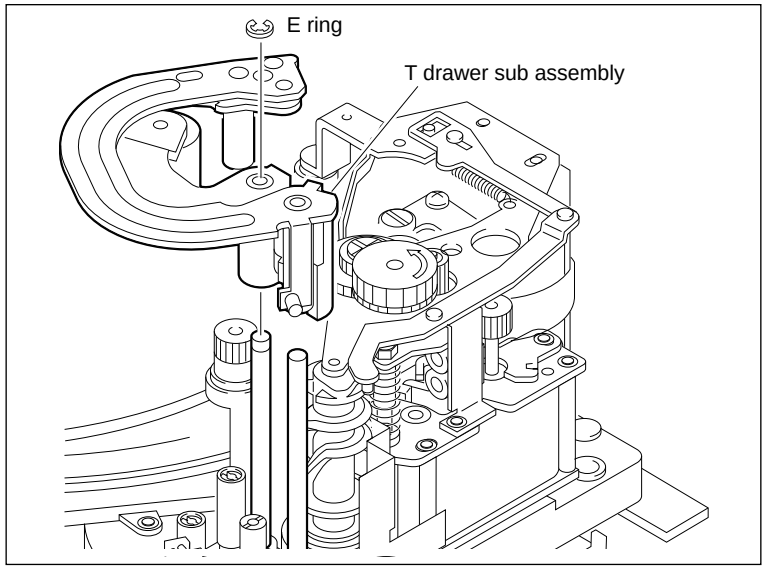
Tool

- Tweezers

Removal

1. T drawer sub assembly removal

Remove the E ring with tweezers to remove the T drawer sub assembly.
(Refer to Section 5-7, procedure 1.)

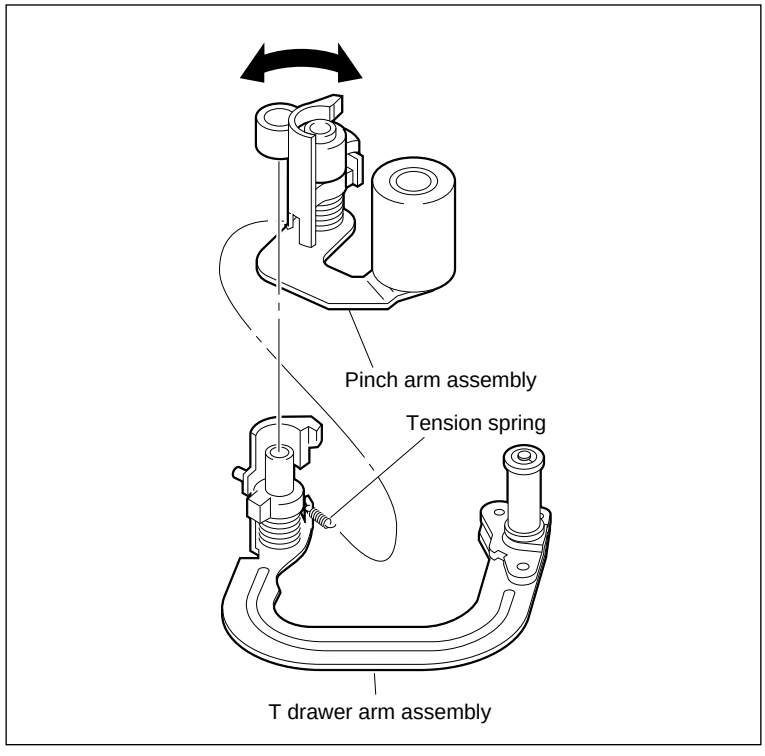


2. Tension spring removal

Move the pinch arm assembly in the arrow direction shown in the figure, and then remove the tension spring.

3. T drawer arm removal

Remove the T drawer arm from the T drawer sub assembly.



Installation

4. Tension spring installation

(1) Hook a new tension spring to the notch of the T drawer arm assembly in the correct direction as shown in the figure 1.

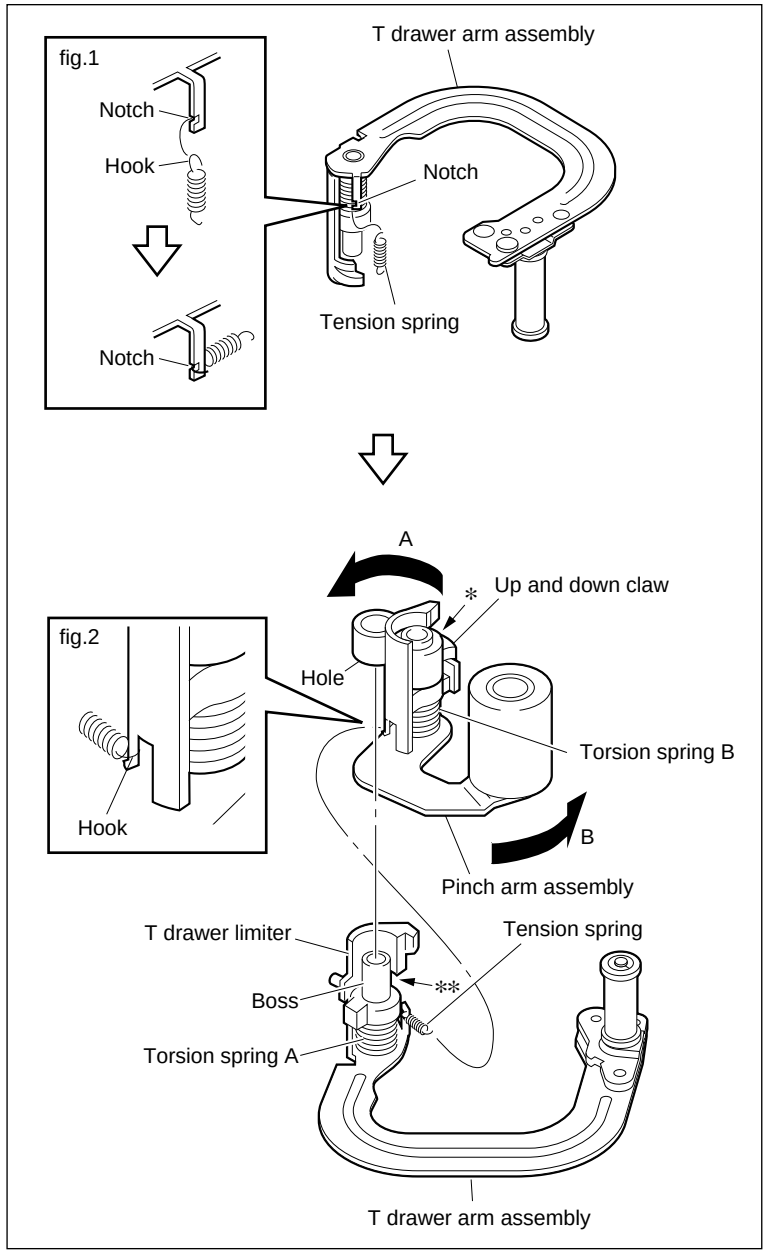
Note

Never install the hook of the tension spring in the incorrect direction.

(2) Shift the up and down claw in the arrow A direction against the pinch arm assembly as shown in the figure.
(3) Insert the boss of the T drawer arm assembly into the hole of the up and down claw as shown in the figure.
(4) Check that the ⁎⁎ marked portion of the T drawer limiter is positioned to the ⁎ marked position of the up and down claw.
(5) Shift the T drawer sub assembly in the arrow B direction, and pass the tension springs between the torsion springs A and B, and then install the hook of the tension spring as shown in the figure 2.

5. T drawer sub assembly reinstallation

Reattach the T drawer sub assembly onto the shaft of the chassis, and fasten it with a new E ring. (Refer to Section 5-7, procedure 3.)



Adjustment after replacement

6. Operation check

(1) Turn on the power.
(2) Check that the threading and unthreading operation are smooth.

Section 6
Main Parts Replacement

6-1. Threading Motor Replacement

Outline

Replacement

VH cleaner assembly removal
AT head assembly removal
Threading motor assembly removal
Threading motor replacement
Threading motor assembly reinstallation
AT head assembly reinstallation
VH cleaner assembly reinstallation

Adjustment after replacement

AT head position adjustment

Precautions

- The threading motor can be replaced with the cassette compartment attached.
- The following new loading motor pulley is required when replacing the threading motor.
  Loading motor pulley: 3-611-492-01

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver's bit (for M1.4): J-6325-110-A
- Torque screwdriver's bit (for M2): J-6325-380-A

Replacement

1. VH cleaner assembly removal

Remove the VH cleaner assembly. (Refer to Section 5-6.)

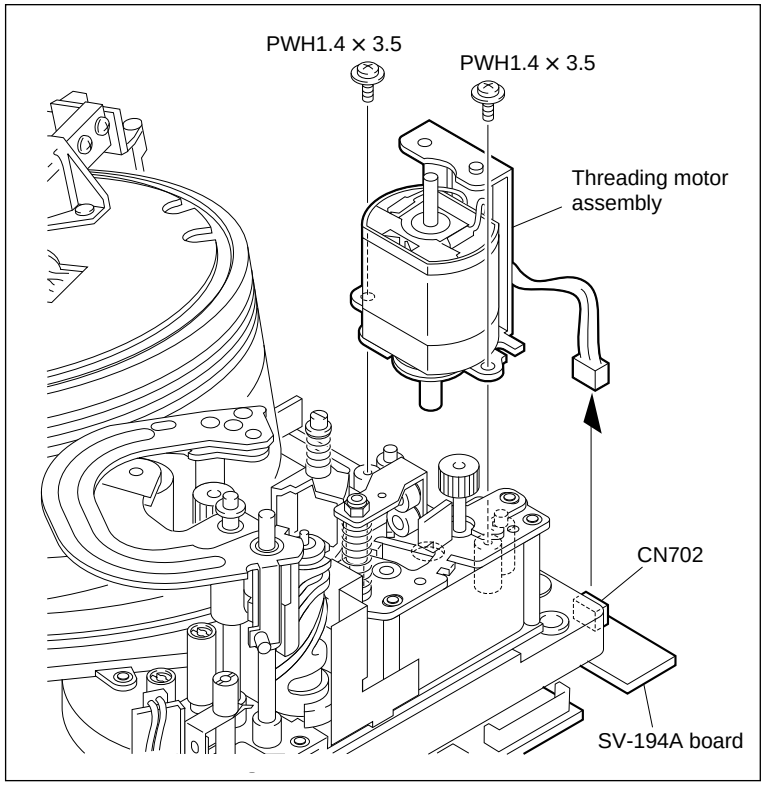
2. AT head assembly removal

Remove the AT head assembly. (Refer to Section 6-14.)

3. Threading motor assembly removal

(1) Disconnect the harness connector from the connector CN702 on the SV-194A board.

(2) Remove the two screws to remove the threading motor assembly.
Leave the timing belt on the mechanical deck.

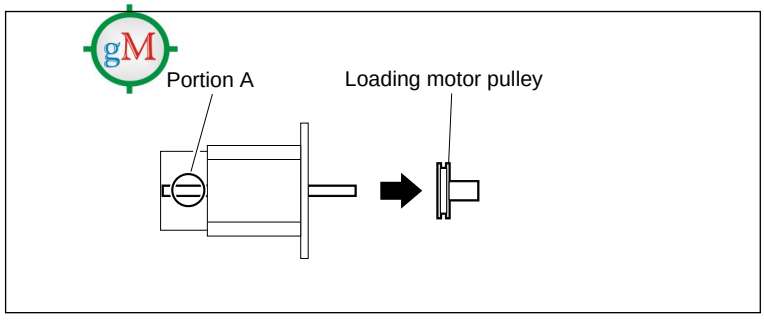


4. Threading motor replacement

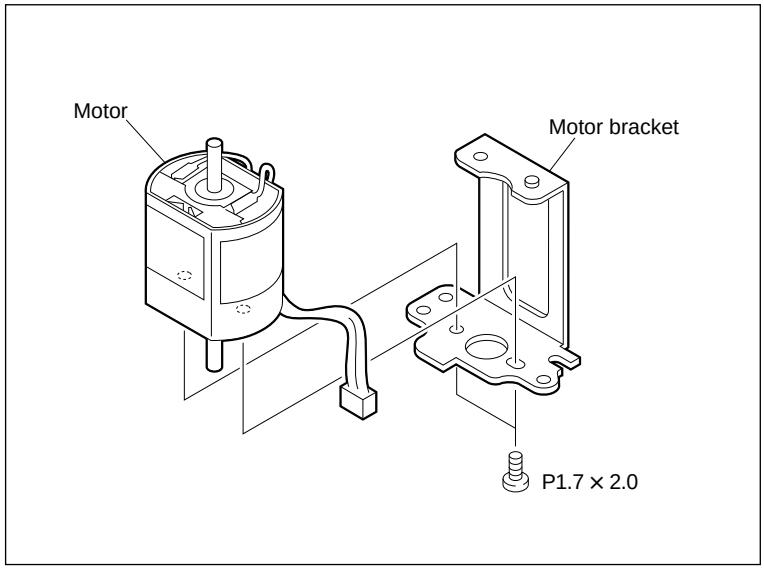
(1) While holding the A portion of the motor shaft with nippers, remove the loading motor pulley from the motor shaft.

Note

During this process, take much care not to press the motor shaft against the motor.



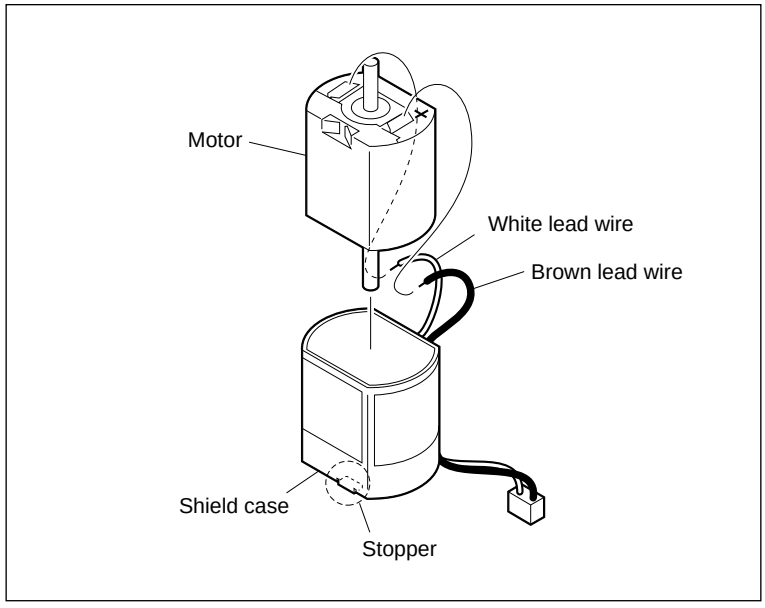
(2) Remove the two screws to remove the motor from the motor bracket.



(3) Unsolder the two wires of the motor, and then remove the motor from the shield case.
(4) Unsolder the two wires of a new motor, and then slide in a new motor into the shield case in the direction shown in the figure.
(5) Solder the wires unsoldered in step (3) to the new motor.

Note

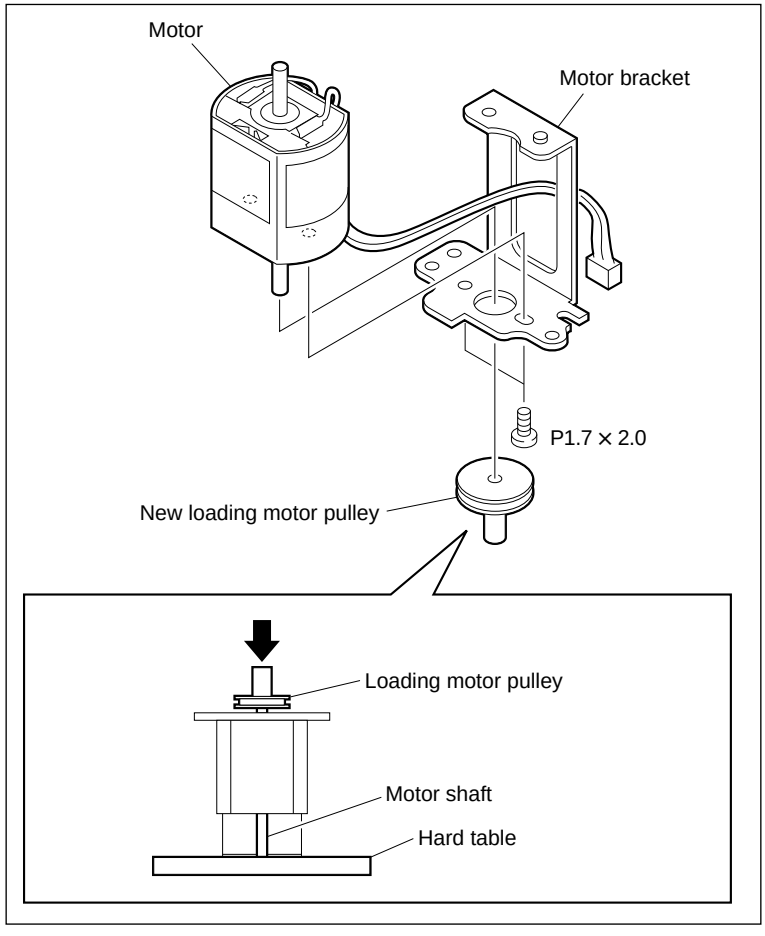
Be sure to solder the brown lead wire to the (+) terminal.



(6) Attach the motor to the motor bracket with the two screws.
Tightening torque : 20×10^{-2} N•m
{2.0 kgf•cm}
(7) Slide a new loading motor pulley onto the motor shaft, and then push it as far as it will go.

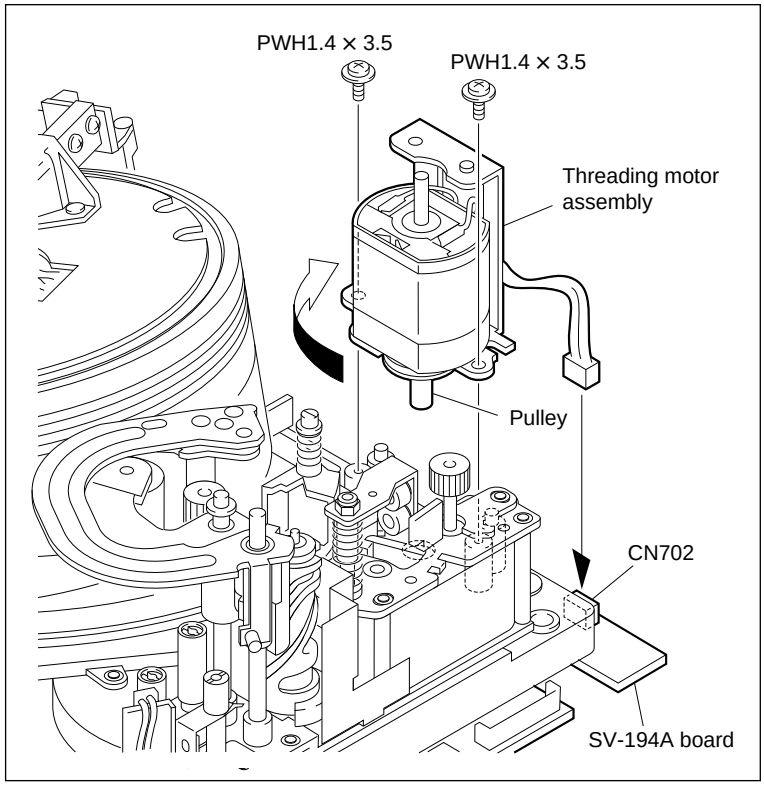
Note

Be sure to put the other end of the motor shaft on a hard table when pressing as shown in the figure.



5. Threading motor assembly reinstallation

(1) Put the threading motor assembly onto the mechanical deck with the two screws while looping the timing belt over the pulley of the threading motor assembly.
(2) Turn the threading motor assembly in the direction indicated by the arrow, and then fasten it with the two screws.
(3) Connect the harness of the threading motor to CN702 on the SV-194A board.



6. AT head assembly reinstallation

Reattach the AT head assembly.
(Refer to Section 6-14.)

7. VH cleaner assembly reinstallation

Reattach the VH cleaner assembly.
(Refer to Section 5-6.)

Adjustment after replacement

8. AT head position adjustment

(Refer to Section 7-8.)

6-2. GB Gear Assemblies Replacement

Outline

Replacement

VH cleaner assembly removal
AT head assembly removal
Plate (2) removal
Gear box housing removal
GB (2) gear assembly removal
GB (1) gear assembly replacement
GB (3) gear assembly replacement
Gear box housing reinstallation
GB (2) gear assembly installation
Plate (2) reinstallation
ME gear reinstallation
Timing belt reinstallation check
AT head assembly reinstallation
VH cleaner assembly reinstallation

Adjustment after replacement

AT head position adjustment

Precaution

Bearings are provided at the tip of each gear assembly. Be careful not to lose them during removal and installation.

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Grease (PG-662) : 7-651-000-59
- Tweezers

Replacement

1. VH cleaner assembly removal

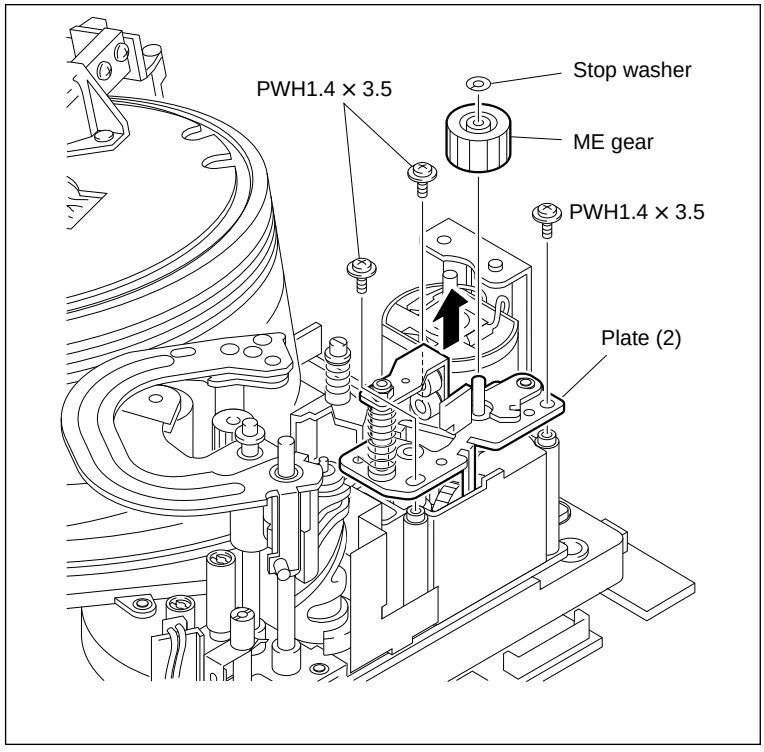
Remove the VH cleaner assembly. (Refer to Section 5-6.)

2. AT head assembly removal

Remove the AT head assembly. (Refer to Section 6-14.)

3. Plate (2) removal

(1) Remove the stop washer to remove the ME gear.
(2) Remove the three screws, and then remove the plate (2) in the direction indicated by the arrow.

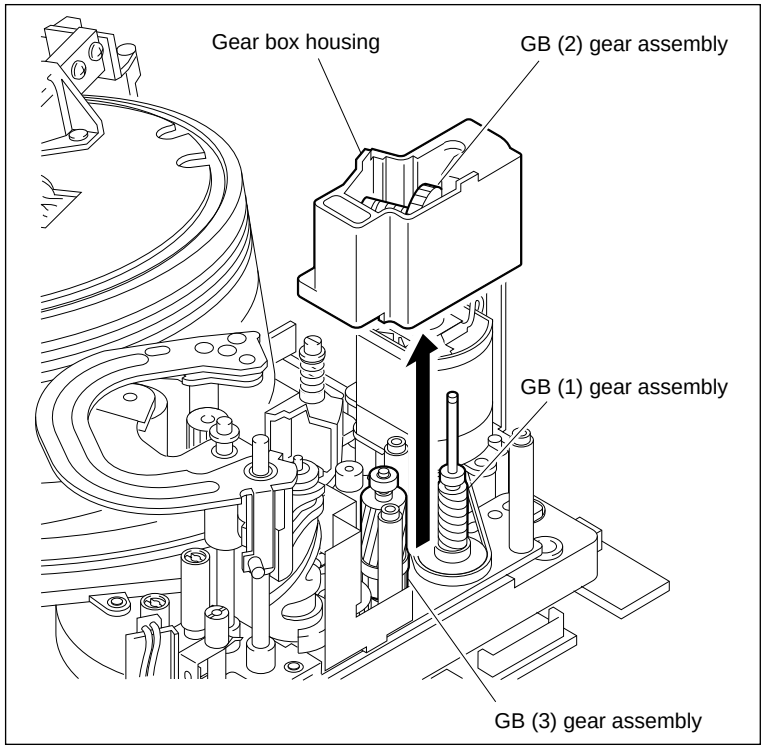


4. Gear box housing removal

Lift the gear box housing out.

Notes

- At that time, the GB (2) gear assembly in the housing is removed together. The GB (1) gear assembly and GB (3) gear assembly are left on the mechanical deck.
- Bearings are provided at the tip of each gear shaft. Be careful not to lose them.



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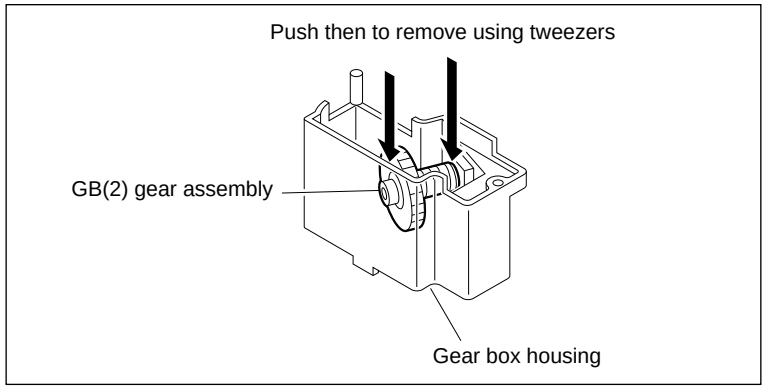
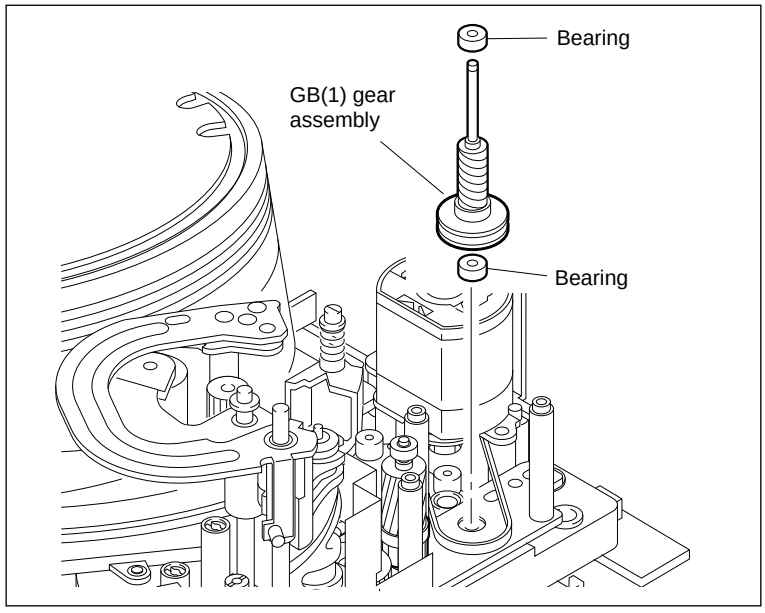
5. GB (2) gear assembly removal

(1) Push both ends of the GB (2) gear assembly from the back of the gear box housing using tweezers, and then remove it.
(2) Remove the bearings from the shafts on both ends of the removed GB (2) gear assembly.



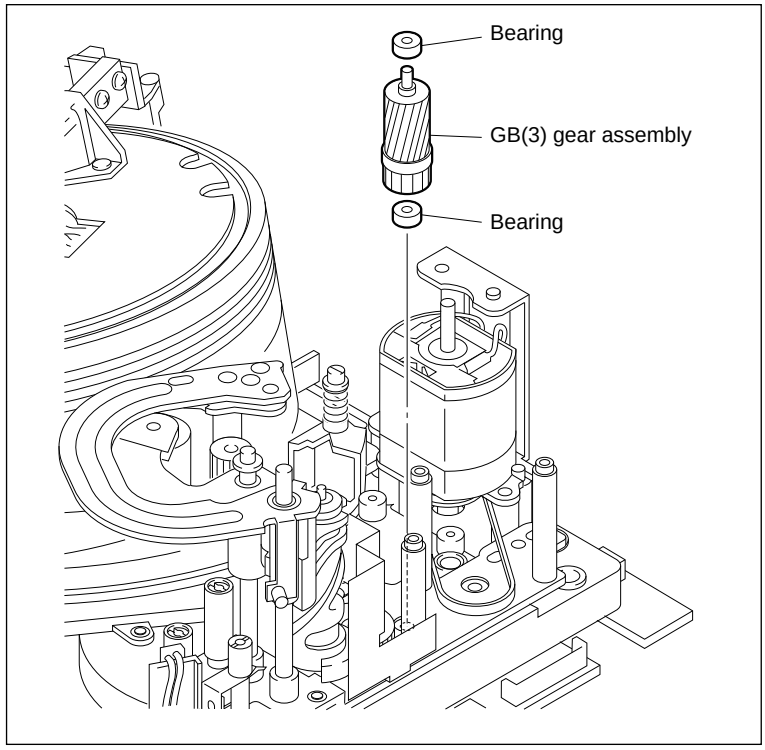
6. GB (1) gear assembly replacement

(1) Remove the bearings from the shafts at both ends of the GB (1) gear assembly.
(2) Clean the shafts at both ends of a new GB (1) gear assembly with a dry cloth.
(3) Reattach bearings onto the shafts at both ends of the GB (1) gear assembly.



7. GB (3) gear assembly replacement

(1) Remove the bearings from the shafts at both ends of the GB (3) gear assembly.
(2) Clean the shafts at both ends of a new GB (3) gear assembly with a dry cloth.
(3) Reattach bearings onto the shafts at both ends of the GB (3) gear assembly.



8. Gear box housing reinstallation

(1) Loop the timing belt over the pulley of the GB (1) gear assembly, and insert the GB (1) gear assembly onto the hole on the mechanical deck and put up the gear assembly.

(2) Insert the bearing of the GB (3) gear assembly onto the hole shown in the figure and put up the gear assembly.

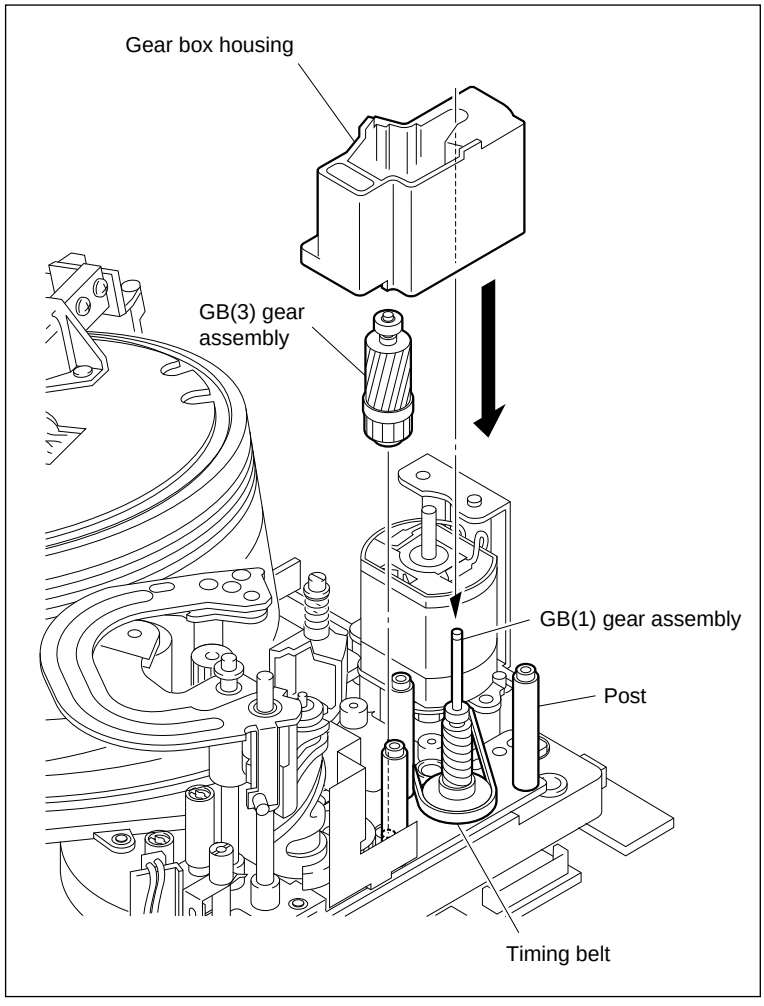
Note

Be careful not to lose the bearing during installation.

(3) Put the gear box housing among the three posts on the mechanical deck as shown in the figure, and push the gear box housing toward the mechanical deck as far as it will go.

Note

Be careful not to pinch the timing belt between the gear box housing and mechanical deck.



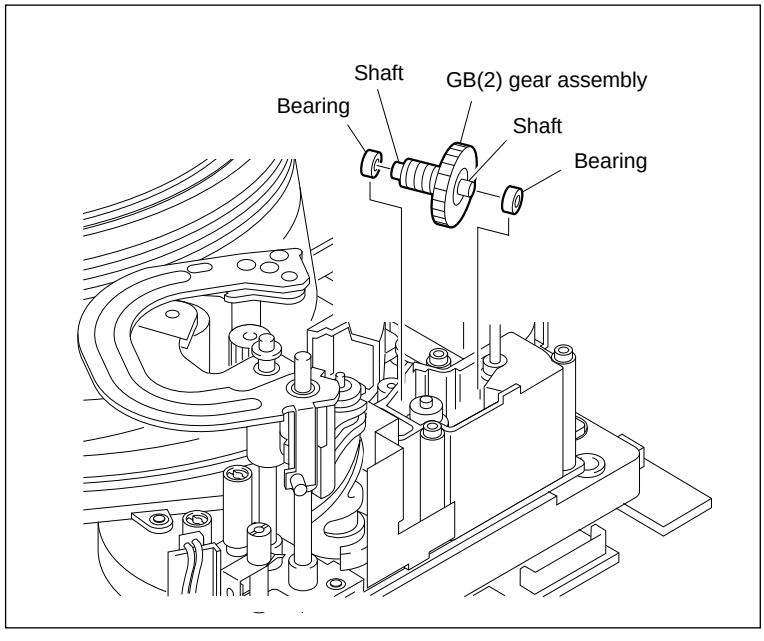
9. GB (2) gear assembly installation

(1) Clean the shafts at both ends of the GB (2) gear assembly with a dry cloth.

(2) Insert the bearings into the shafts at both ends of the GB (2) gear assembly.

(3) Apply grease thinly to the whole gear circumference of the GB (2) gear assembly.

(4) Insert the GB (2) gear assembly from the top of the gear box housing in the direction shown in the figure, and then push both ends of the assembly using tweezers to attach it securely.



10. Plate (2) reinstallation

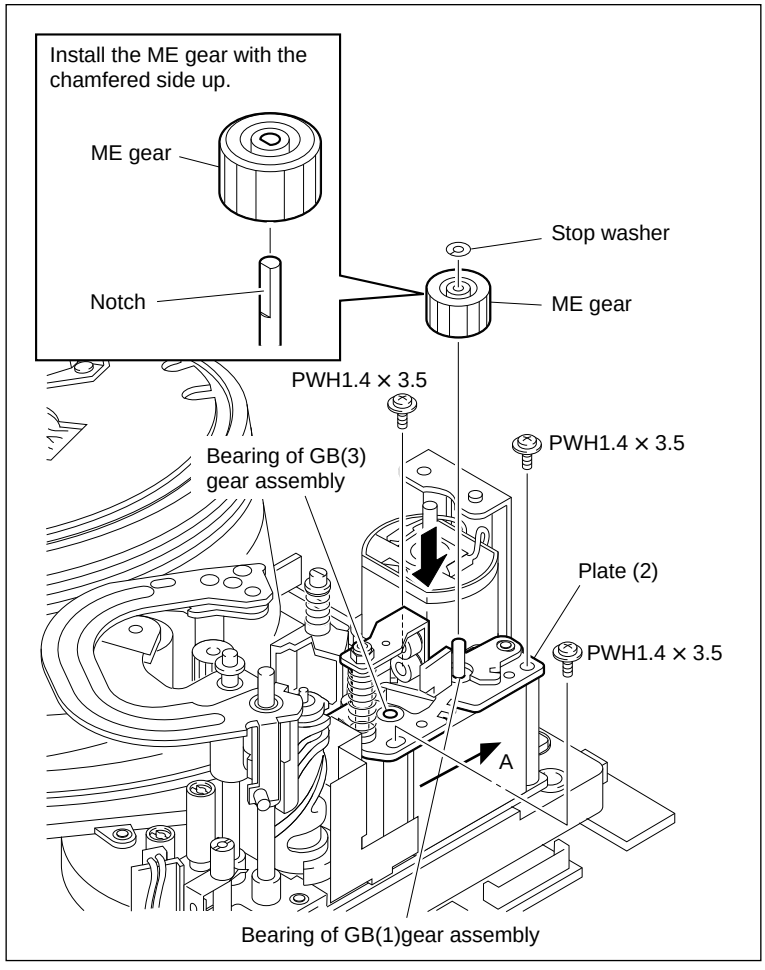
(1) Reattach the plate (2) into the gear box housing, and then check that the bearing at the tips of the GB (3) gear assembly and GB (1) gear assembly are firmly put into the dented hole of plate (2).
(2) While pushing the plate (2) in the arrow A direction, fasten the plate (2) with the three screws.

11. ME gear reinstallation

Secure the ME gear with a new stop washer.

Note

Align the notch at the tip of the shaft with the hole of the ME gear when the ME gear is reattached.



12. Timing belt reinstallation check

Turn the ME gear to check that the timing belt is looped over the pulley of the threading motor. If the timing belt is off, remove the threading motor assembly from the mechanical deck once, and then loop the timing belt over the pulley.

13. AT head assembly reinstallation

Reattach the AT head assembly.
(Refer to Section 6-14.)

14. VH cleaner assembly reinstallation

Reattach the VH cleaner assembly.
(Refer to Section 5-6.)

Adjustment after replacement

15. AT head position adjustment

(Refer to Section 7-8).

6-3. Full Erase Head Replacement

Outline

Replacement

CTL/FE head assembly removal
Full erase head removal
Full erase head replacement
CTL/FE head assembly reinstallation
CTL/FE head assembly cleaning

Adjustment after replacement

Tape running adjustment

CAUTION

Never contact the tape cleaner at the entrance head block with bare hands. The tape cleaner has a sharp edge. Pay careful attention to it when the full erase head is replaced or adjusted.

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Torque screwdriver's bit (for M2) : J-6325-380-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01

Replacement

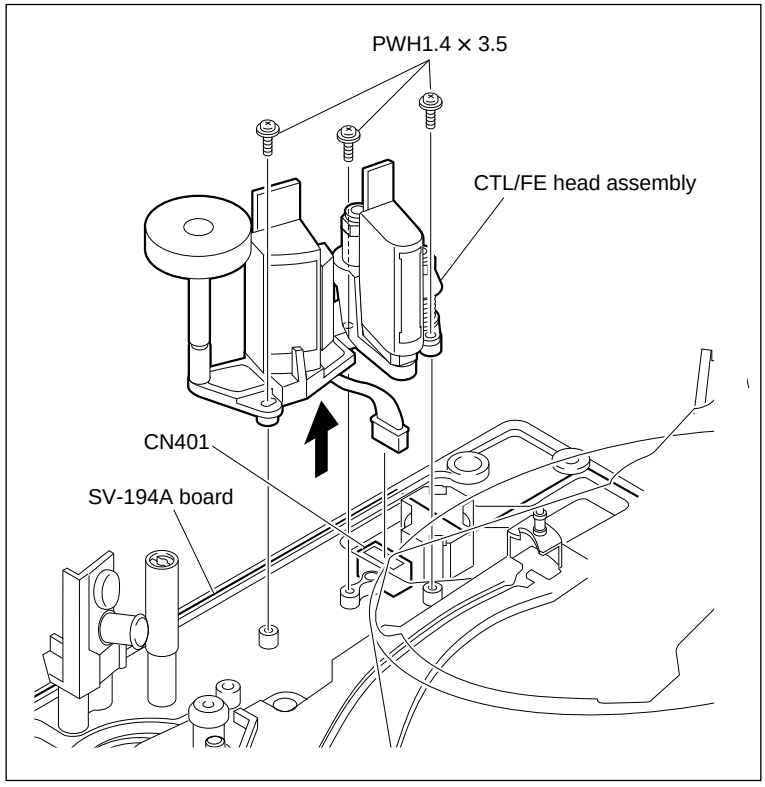
1. CTL/FE head assembly removal

(1) Remove the three screws from the CTL/FE head assembly.

(2) Disconnect the harness connector from the connector CN401 on the SV-194A board to remove the CTL/FE head assembly.

Note

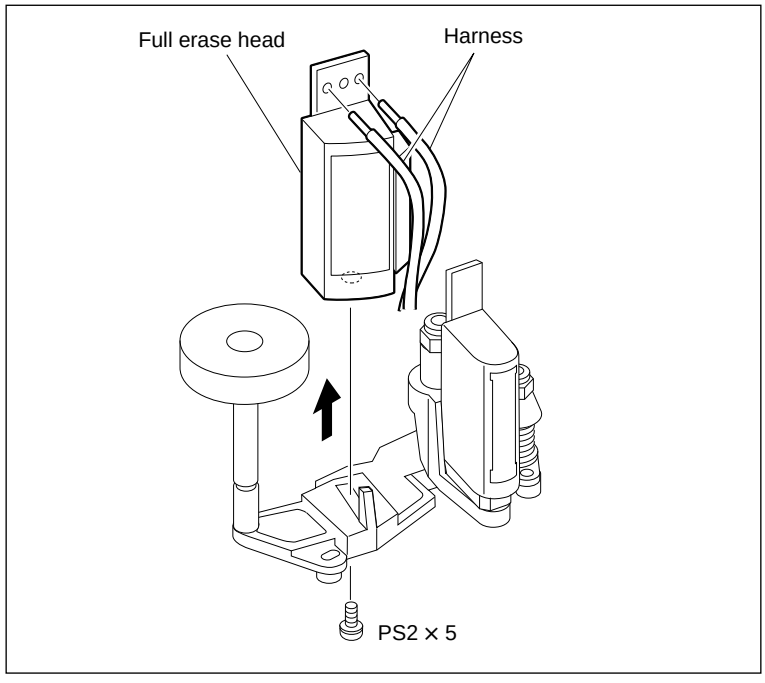
Be careful not to damage the video heads, drum, tape guide and other parts with a screwdriver.



2. Full erase head removal

(1) Unsolder the two wires soldered to the full erase head.

(2) Remove the one screw from the back side of the CTL/FE head assembly to remove the full erase head.



3. Full erase head replacement

CAUTION

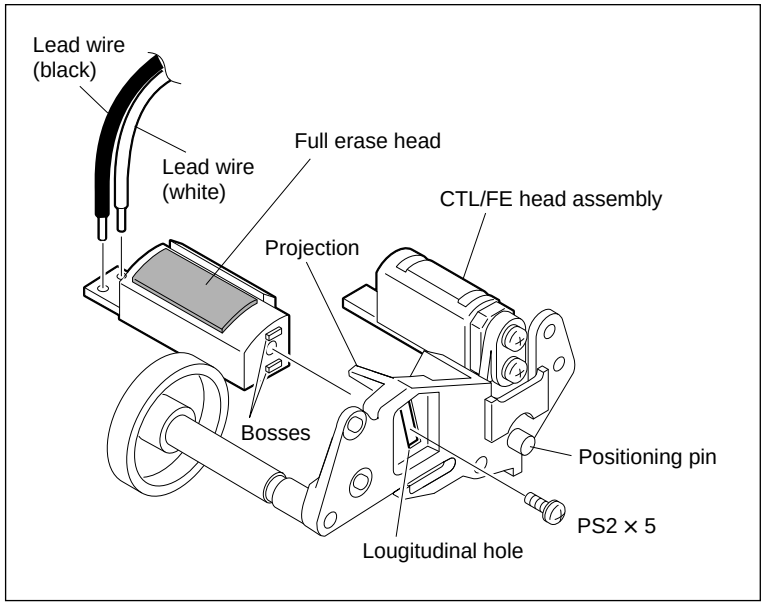
The full erase head is equipped with the tape cleaner which has a sharp edge.
Do not contact it with bare hands. Pay careful attention to it when handling.

(1) Put the two bosses of a new full erase head into the longitudinal hole of the CTL/ FE head assembly, and then fasten it with the one screw. At that time, tighten the screw while pushing the head surface toward the projection.
Tightening torque : 20×10^{-2} N•m
{2.0 kgf•cm}

(2) Solder the two wires to the printed circuit board of the full erase head.

Note

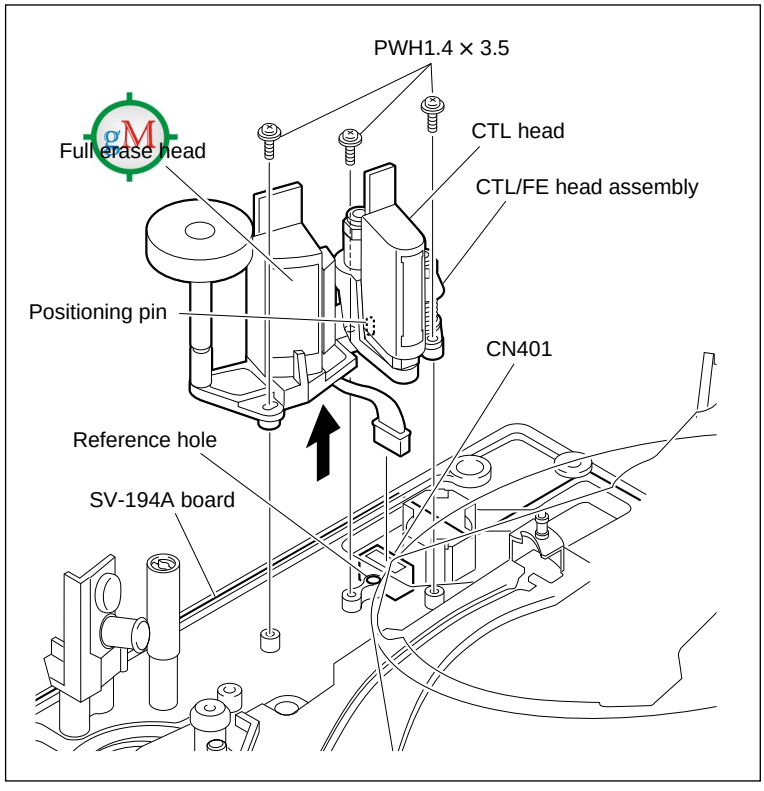
Be sure to solder the wires in the correct positions.



4. CTL/FE head assembly reinstallation

(1) Insert the positioning pin of the CTL/FE head assembly onto the reference hole of the mechanical deck, and then secure it with the three screws.

(2) Reconnect the harness of the CTL/FE head assembly to the connector CN401 on the SV-194A board.



5. CTL/FE head assembly cleaning

Wipe the CTL head, full erase head, tape cleaner and tape guide with a cleaning cloth moistened with a cleaning fluid.

Note

After cleaning, be sure to wipe them with a dry cloth.

Adjustment after replacement

6. Tape running adjustment

(Refer to Section 7-4.)

6-4. S Brake Solenoid Replacement

Outline

Replacement

SV-194A board removal
Cassette compartment removal
S brake assembly removal
Brake solenoid replacement
S brake assembly reinstallation
Solenoid operation check
Cassette compartment reinstallation
SV-194A board reinstallation

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.

Tools

- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Torque screwdriver's bit (for M2) : J-6325-380-A
- Hexagon bit (for torque driver) : J-6326-120-A

Replacement

1. SV-194A board removal

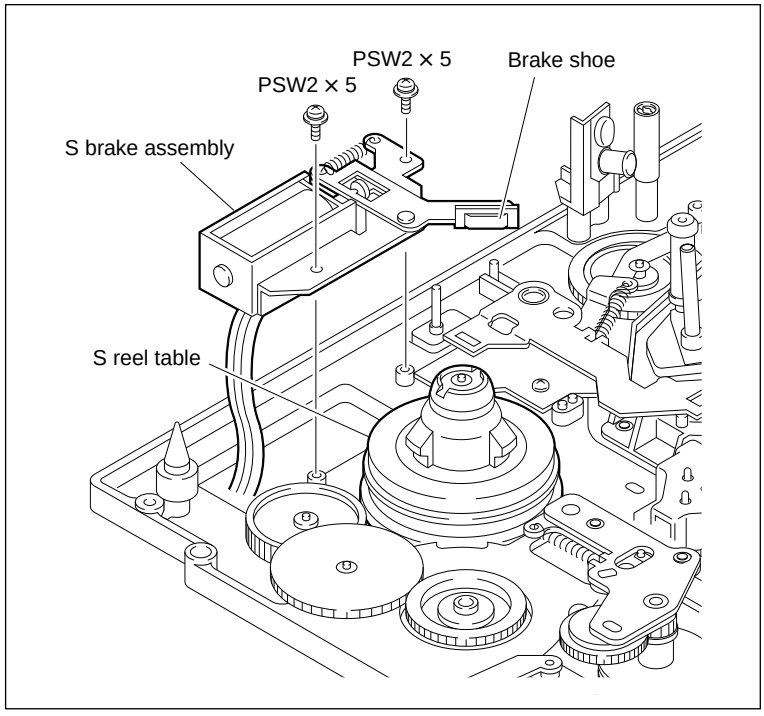
Remove the SV-194A board. (Refer to Section 6-17-1.)

2. Cassette compartment removal

Remove the cassette compartment. (Refer to Section 1-5.)

3. S brake assembly removal

Remove the two screws, and then remove the S brake assembly while releasing the brake shoe from the S reel table.

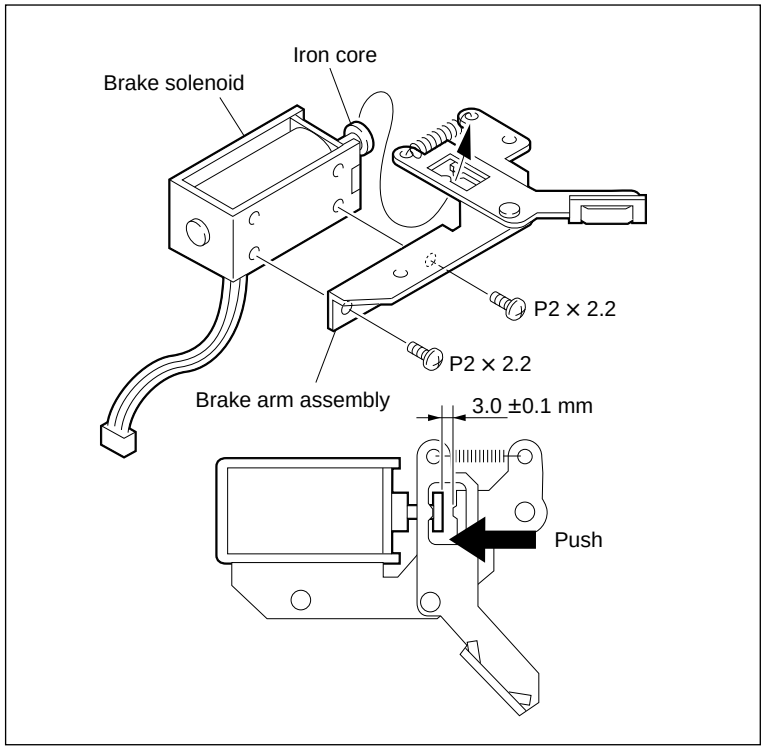


4. Brake solenoid replacement

(1) Remove the two screws shown in the figure to remove the brake solenoid.

(2) Insert the iron core tip of a new brake solenoid into the hole of the brake arm assembly in the direction shown in the figure. And then, loosely tighten the two screws which is applied the locking compound onto its thread and fix a new brake solenoid to the brake arm assembly.

(3) To position the brake solenoid so that the clearance between the tip of iron core and the protrusion of brake arm assembly is 3.0 ±0.1 mm, press in the iron core in the direction of the arrow by a finger and retighten the two screws.
Tightening torque : 20×10^{-2} N•m
{2.0 kgf•cm}

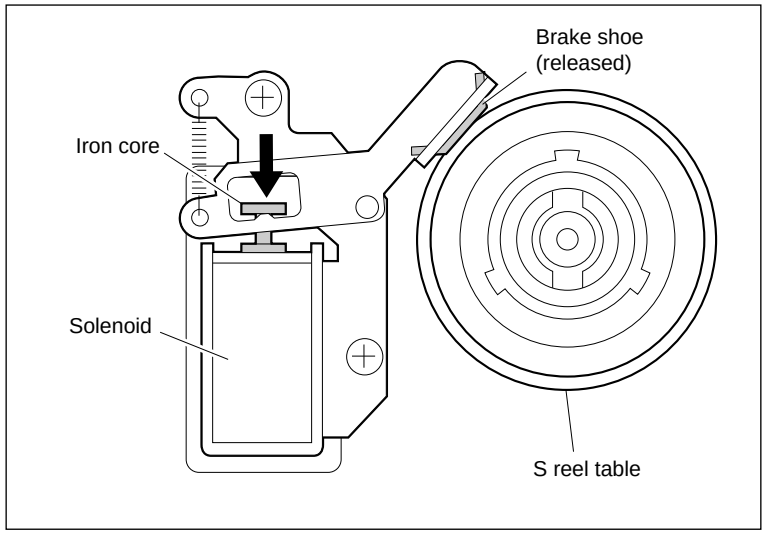


5. S brake assembly reinstallation

(1) Pass the harness of the S brake assembly through the square hole of the mechanical deck.
(2) Reattach the S brake assembly on the mechanical deck with the two screws.

6. Solenoid operation check

(1) Check that the brake is applied when the S reel table is manually turned in the clockwise direction.
(2) Press in the iron core of the solenoid in the energized direction with a finger, check that the brake shoe is released from the S reel table and that the S reel table can smoothly rotate in the clockwise direction by hand.



7. Cassette compartment reinstallation

Reattach the cassette compartment.
(Refer to Section 1-5.)

8. SV-194A board reinstallation

Reattach the SV-194A board.
(Refer to Section 6-17-1.)

6-5. S/T Slider and S/T Threading Gear Replacement

Outline

Replacement

VH cleaner assembly removal
T drawer sub assembly removal
Drum assembly removal
T tension regulator arm removal
Tension regulator band removal
S tension regulator arm removal
S and T catchers removal
Protector removal
Threading link assembly removal
Slider removal
Threading gear assembly removal
Cleaning and lubrication
Threading gear assembly installation
Slider installation
Threading link assembly installation
Protector reinstallation
S and T catchers reinstallation
Tension regulator band reinstallation
T tension regulator arm reinstallation
S tension regulator arm reinstallation
Drum assembly reinstallation
T drawer sub assembly reinstallation
VH cleaner assembly reinstallation

Adjustment after replacement

Tape running adjustment
Video tracking adjustment
CTL head position adjustment
AT head position adjustment

Precautions

- The following new stop washers and E rings are required when replacing the S/T threading link.
  E ring (2.3) (for T drawer sub assembly) : 7-624-105-04 × 1
  E ring (1.2) (for S/T slider) : 7-624-101-04 × 2
  Stop washer (for tension regulator band) : 3-559-408-11 × 2
  (for T tension regulator arm)
- The two parallel pins (d = 2.0 mm) and a parallel pin (d = 1.6 mm) of tool are required for gear phase adjustment.

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Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

- Stop washer fastening tool : J-6323-530-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Torque screwdriver's bit (for M2) : J-6325-380-A
- Parallel pin (d = 1.6 mm) : 3-649-266-01
- Parallel pin (d = 2.0 mm) : 3-703-358-04
- Oil : 7-661-018-18
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01
- Grease (PG-662) : 7-651-000-59

Replacement

1. VH cleaner assembly removal

Remove the VH cleaner assembly.
(Refer to Section 5-6.)

2. T drawer sub assembly removal

Remove the T drawer sub assembly.
(Refer to Section 5-7.)

3. Drum assembly removal

Remove the drum assembly.
(Refer to Section 5-5.)

4. T tension regulator arm removal

Remove the T tension regulator arm.
(Refer to Section 5-9.)

5. Tension regulator band removal

Remove the tension regulator band.
(Refer to Section 5-9.)

6. S tension regulator arm removal

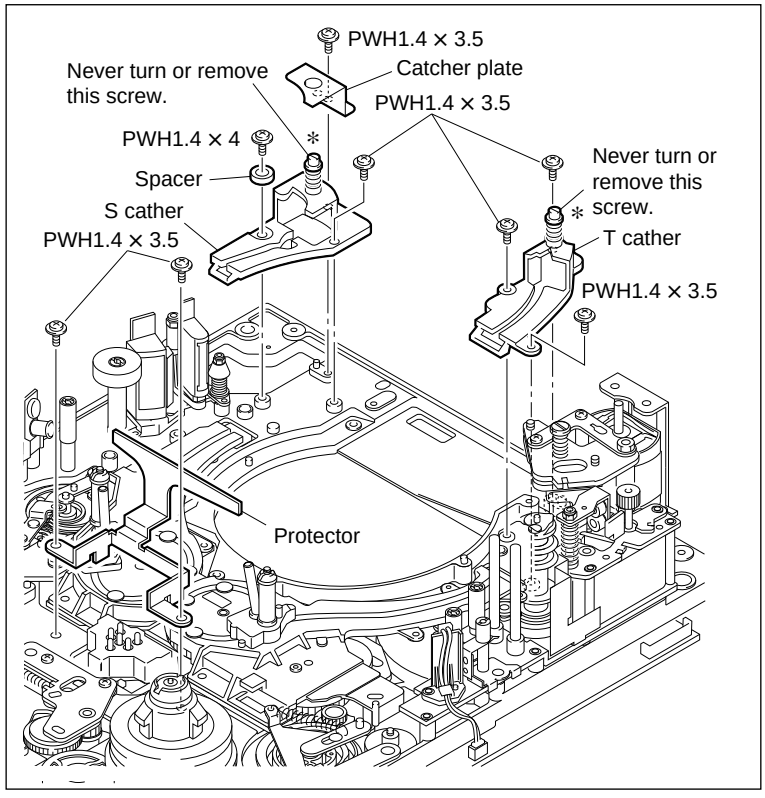
Remove the S tension regulator arm.
(Refer to Section 6-9.)

7. S and T catchers removal

Remove the three screws respectively, and then remove the S catcher, catcher plate, and T catcher.

Note

Never turn or remove the ✻ marked screws shown in the figure.



8. Protector removal

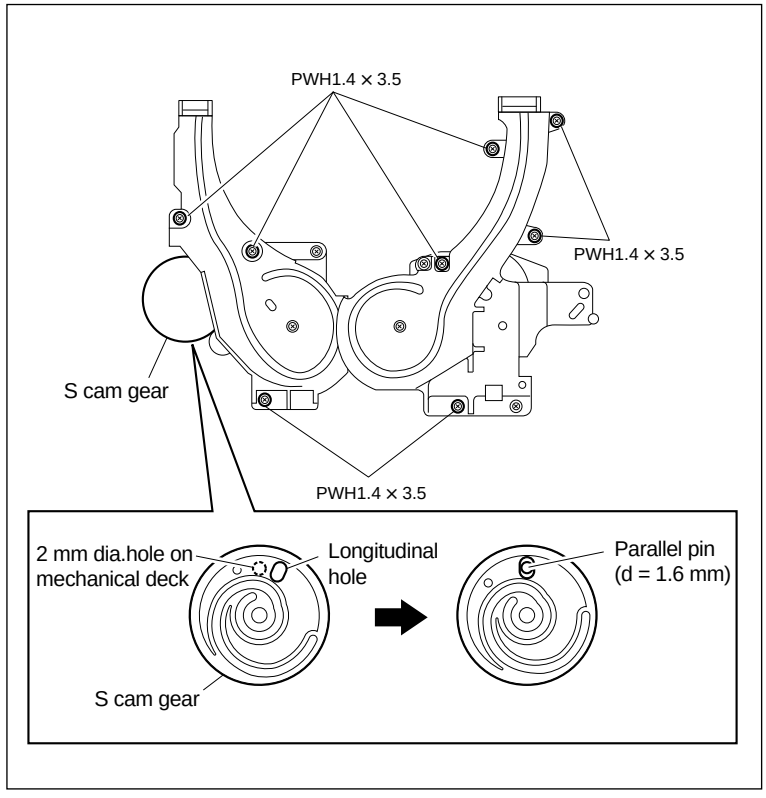
Remove the two screws, and remove the protector.

9. Threading link assembly removal

(1) Turn the S cam gear with a finger to align the longitudinal hole of the S cam gear with the reference hole (2.0 mm) on the mechanical deck as shown in the figure. And then insert the parallel pin (d = 2.0 mm) into these holes.
(2) Remove the eight screws shown in the figure.
(3) Remove the threading link assembly.

Note

Being careful not to damage the stationary heads, remove the threading link assembly.

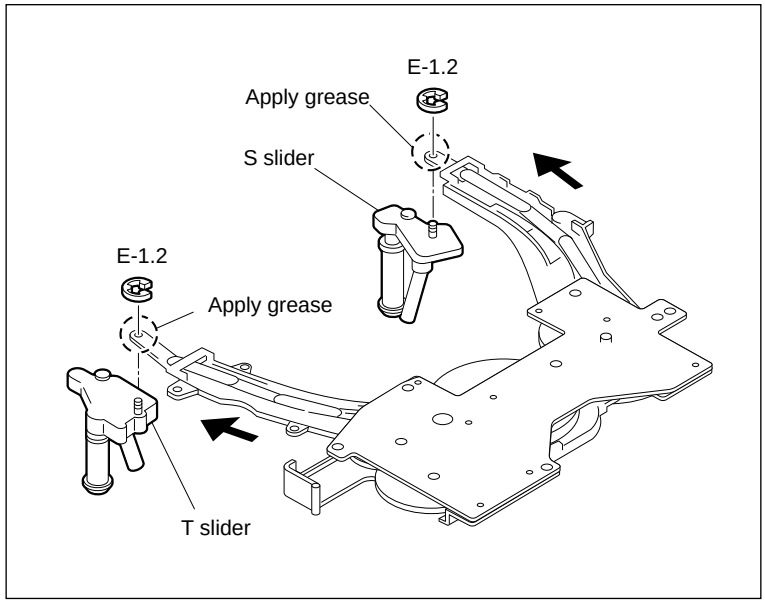


10. Slider replacement

(1) Pull out the slider and remove the E ring at the back of the slider to be replaced.
(2) Pull the slider out from the end of the rail.
(3) Apply grease thinly to both surfaces of the tip of the threading link assembly.

Note

Handle the removed slider gently and take care that the guide and roller are not damage or deformed.

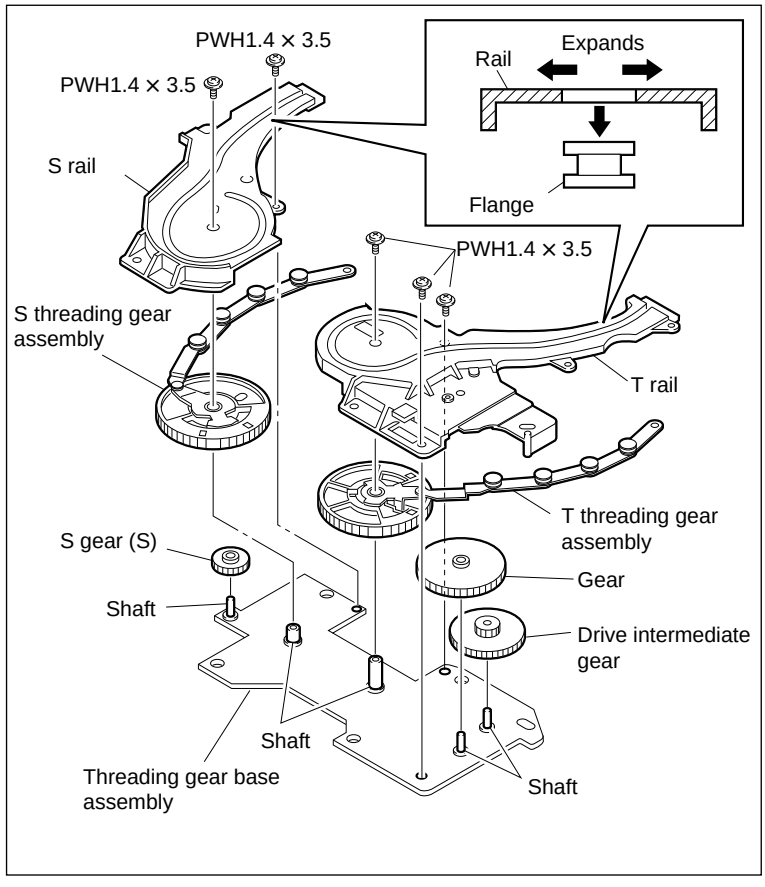


11. Threading gear assembly removal

(1) Remove the link shaft's flange of the gear assembly from the rail while expanding the rail of the threading gear assembly.
(2) Remove the five screws, and then remove the rail and threading gear assembly from the threading link assembly.

12. Cleaning and lubrication

(1) Clean the installation shaft of the removed threading gear assembly with a cleaning cloth moistened with a cleaning fluid.
(2) Apply oil of a 1/4 drop to the cleaned shaft.



13. Threading gear assembly installation

(1) Attach the S gear (S), S threading gear assembly, T threading gear assembly, drive intermediate gear, and gear in the threading gear base assembly while aligning them with the mark shown in the figure.

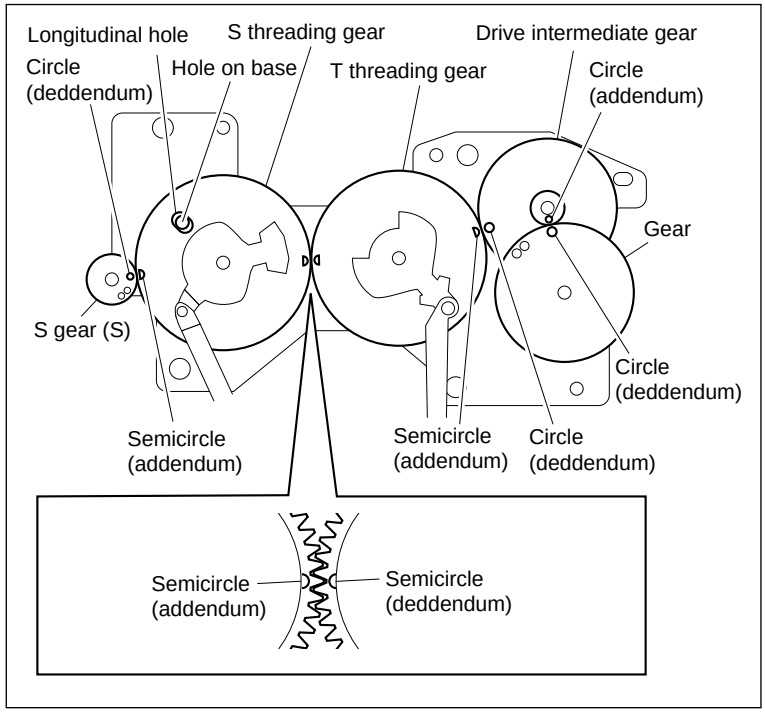
(2) Loosely tighten the center screw of each S and T threading gear, and then reattach the S and T rails.

Note

Be careful not to shift the gear phase between the S gear (S) and S threading gear, because the S threading gear assembly tends to move off from the threading link assembly.

(3) Pass the link shaft's flanges of the S and T threading gear assemblies through the rail while expanding the rail.

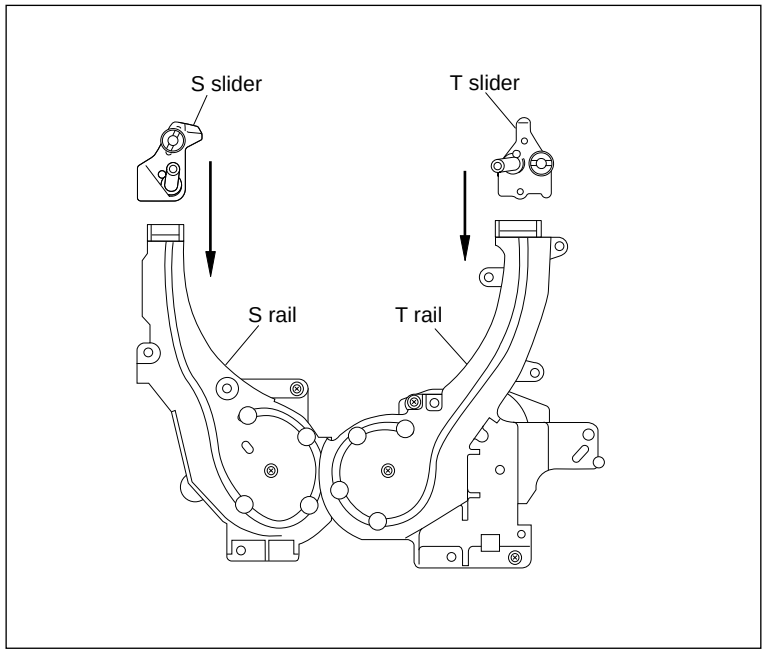
(4) Retighten the gear's center screws and attach the S and T threading gear assemblies with the remaining three screws.



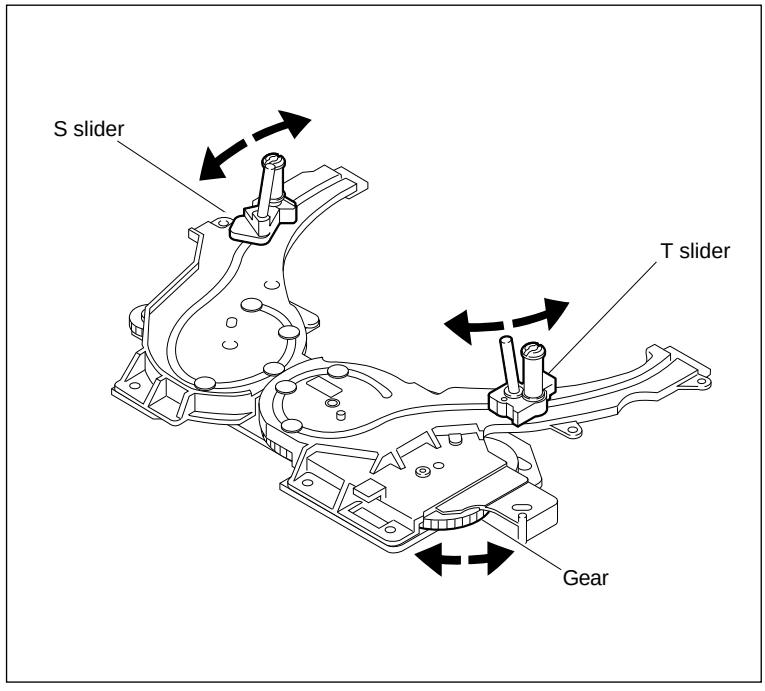
14. Slider reinstallation

(1) Pass the slider through the rail in the direction of the arrow.

(2) Insert the installing shaft of the slider in the installing hole of the link and attach it with a new E ring.

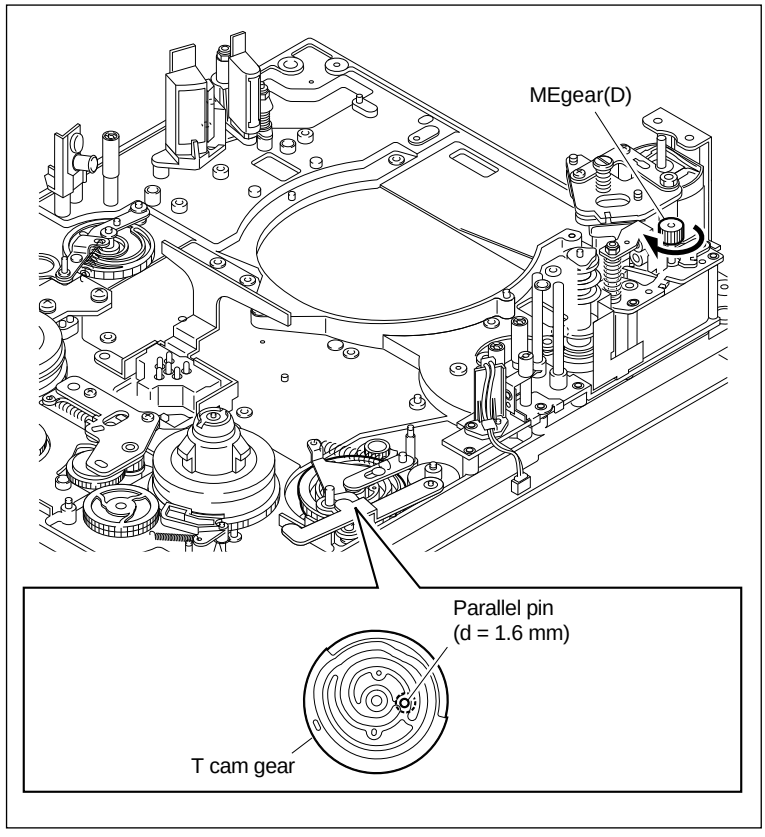


(3) Turn the gear shown in the figure and check that the S and T sliders move smoothly.

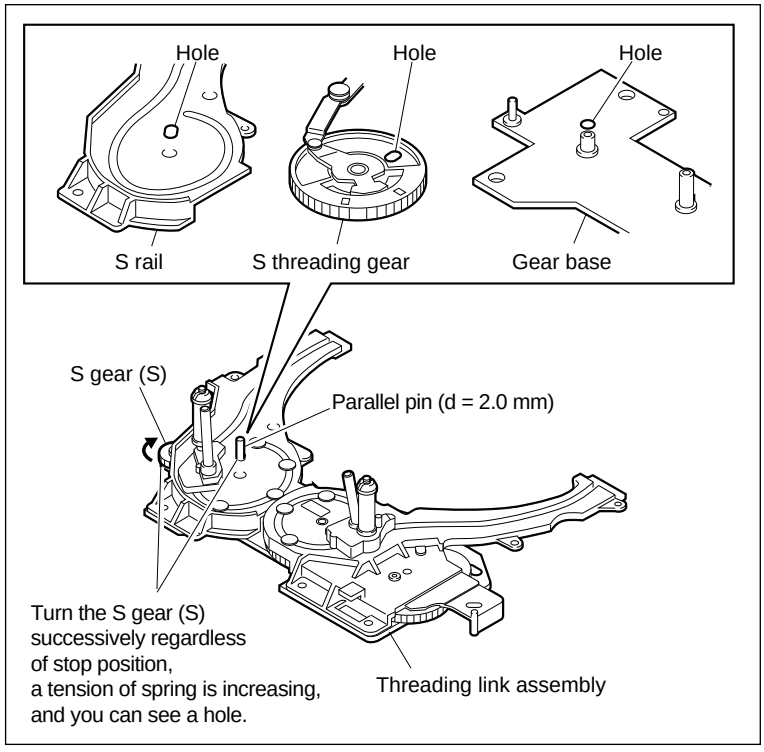


15. Threading link assembly reinstallation

(1) Turn the ME gear (D) clockwise so that the T cam gear hole and mechanical deck hole are located as shown in the figure, and then insert the parallel pin (d = 1.6 mm) into these holes.



(2) Turn the S gear (S) of the threading link assembly clockwise as far as it will go, when opposing the spring force to coincide with three holes, the hole on the S rail shown in the figure, the hole on the S threading gear and the hole on the gear base. And then insert the parallel pin (d = 2.0 mm) into these three holes.



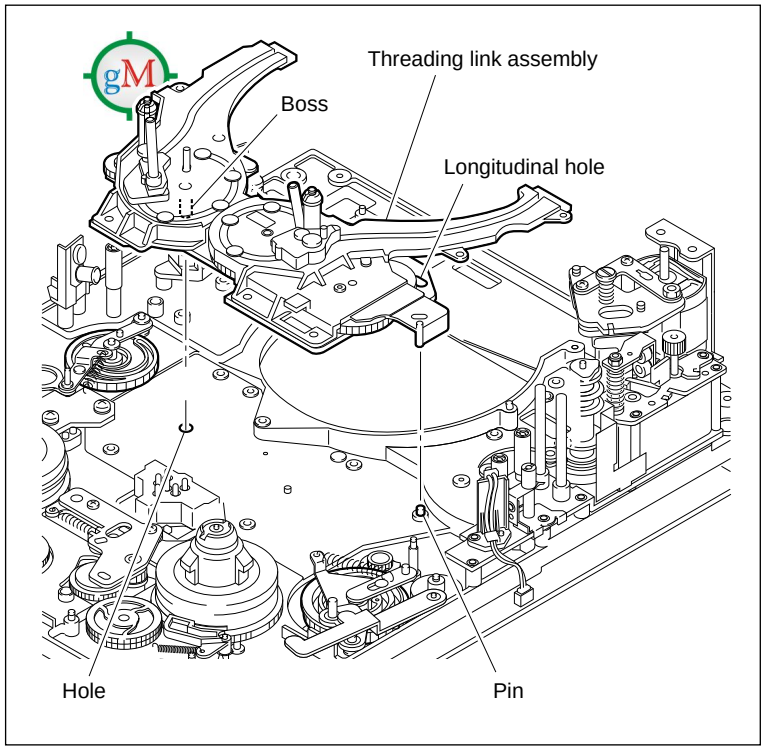
(3) Attach the threading link assembly so that the boss and longitudinal hole of the link assembly are put onto the hole and pin on the mechanical deck.

(4) Fix the base assembly with the eight screws.

Note

Be careful not to damage the stationary head and other parts with a screwdriver during installation.

(5) Pull the three parallel pins out inserted in former procedures.



16. S and T catchers reinstallation
Reattach the S catcher, catcher plate and T catcher with the three screws, respectively.

17. Protector reinstallation
Reattach the protector with the two screws.

18. Tension regulator band reinstallation
Reattach the tension regulator band.
(Refer to Section 5-9.)

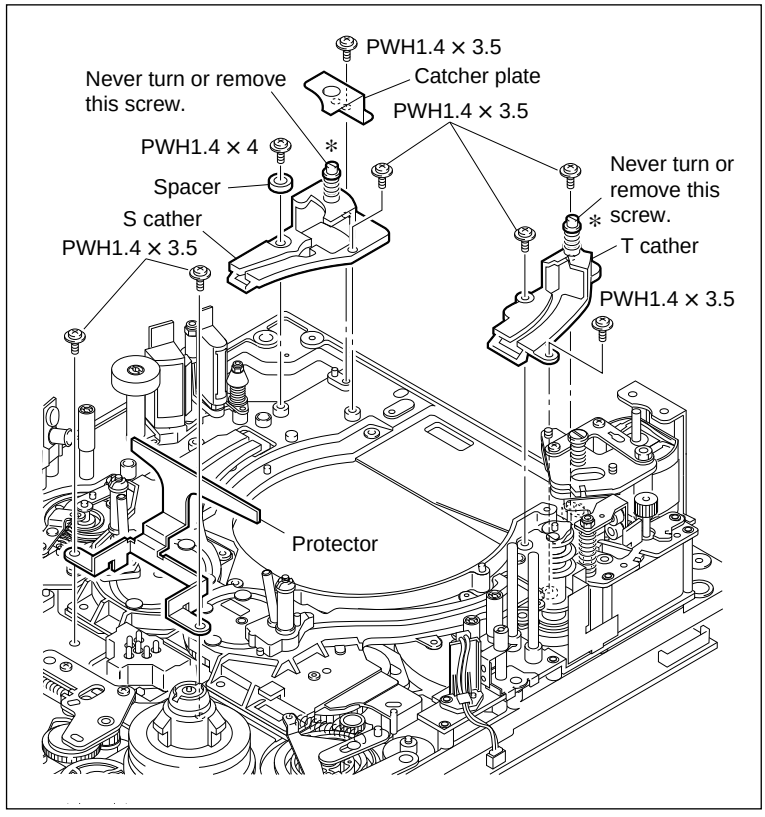
19. T tension regulator arm reinstallation
Reattach the T tension regulator arm.
(Refer to Section 5-9.)

20. S tension regulator arm reinstallation
Reattach the S tension regulator arm with two screws. (Refer to Section 6-9.)

21. Drum assembly reinstallation
Reattach the drum assembly.
(Refer to Section 5-5.)

22. T drawer sub assembly reinstallation
Reattach the T drawer sub assembly.
(Refer to Section 5-7.)

23. VH cleaner assembly reinstallation
Reattach the VH cleaner assembly.
(Refer to Section 5-6.)



Adjustment after replacement

24. Tape running adjustment
(Refer to Section 7-4.)

25. Video tracking adjustment
(Refer to Section 7-5.)

26. CTL head position adjustment
(Refer to Section 7-7.)

27. AT head position adjustment
(Refer to Section 7-8.)

6-6. Reel Table Replacement

Outline

Replacement

Tension regulator band assembly removal (when T reel table is replaced)
S brake assembly removal (when S reel table is replaced)
Reel table removal
Reel shaft cleaning
Reel table cleaning
Reel table installation (1)
Reel table height adjustment
Reel table installation (2)
Tension regulator band assembly reinstallation (when T reel table was replaced)
S brake assembly reinstallation (when S reel table was replaced)
Operation check

Adjustment after replacement

FWD back tension adjustment (when S reel table was replaced)
REV back tension adjustment (when T reel table was replaced)
Tape running adjustment

Precaution

The height of the reel table is used as the reference of a tape running system. After the reel table is replaced, be sure to perform the reel table height adjustment.

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Note

Four poly-slider washers are located at the top and bottom of the reel table.
The poly-slider washers (0.13 mm thickness : 3-303-961-01) at the top of the reel table are nessesary parts as spare ones for the reel table replacement. Be careful not to lose or damage them.

Tools

- Stop washer fastening tool : J-6323-530-A
- Torque cassette : J-6323-890-A
- Reel table height adjustment tool : J-6324-150-A
- Cassette reference plate : J-7032-610-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01
- Torque screwdriver (3 kg) : J-6325 400 A
- Torque screwdriver’s bit (M1.4) : J-6325-110-A

Replacement

1. Tension regulator band assembly removal (when T reel table is replaced)

(1) Remove the stop washer of the tension regulator band assembly.

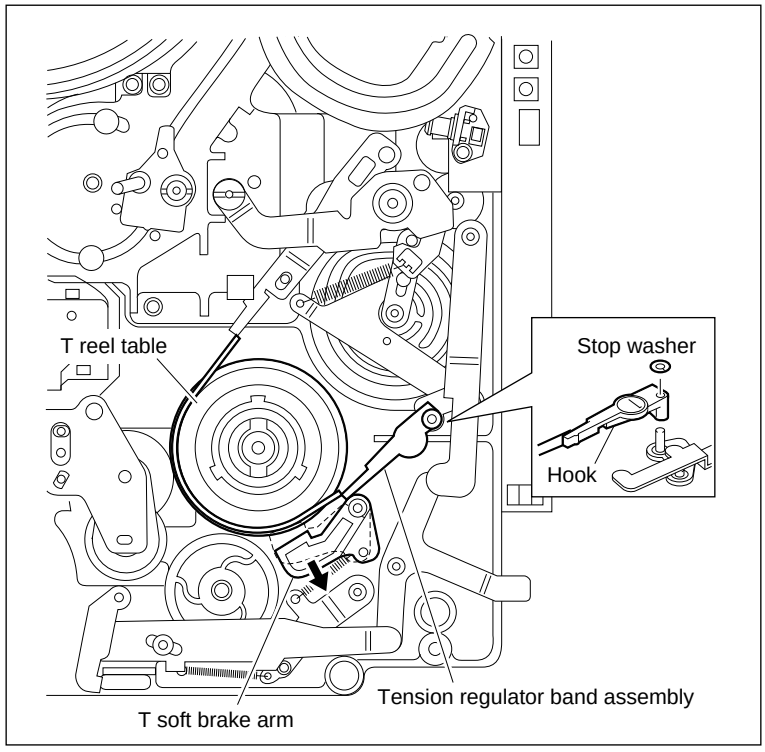
Note

Do not apply excessive force to the tension regulator arm assembly during the stop washer removal.

(2) Move the T soft brake arm in the direction indicated by the arrow with a finger, and then remove the hook of the tension regulator band assembly from the band adjustment plate.

Note

Do not touch the felt surface of the tension regulator band assembly with fingers. Do not bend the tension regulator band assembly or make oil adhere to the felt surface.



2. S brake assembly removal (when S reel table is replaced)

Remove the S brake assembly.
(Refer to Section 5-11.)

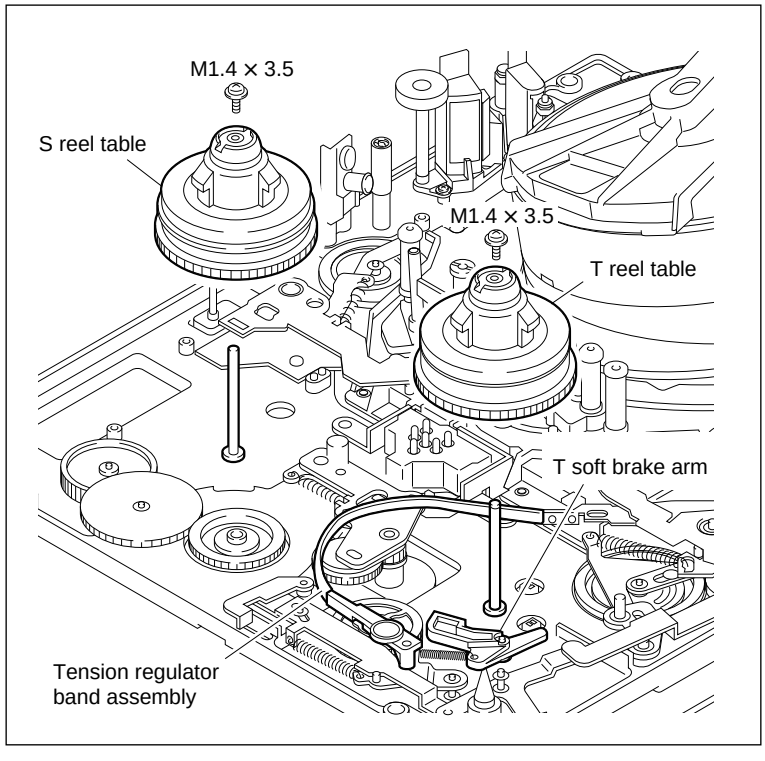
3. Reel table removal

(1) Remove the screw on the top of the reel table.

(2) Pull the reel table out while releasing the tension regulator band assembly and T soft brake arm or S main brake, which interfere with the reel table, with a finger.

Note

If poly-slider washers may cling to the bottom of the reel table and remove together, return all the poly-slider washers onto the reel shaft.



4. Reel shaft cleaning

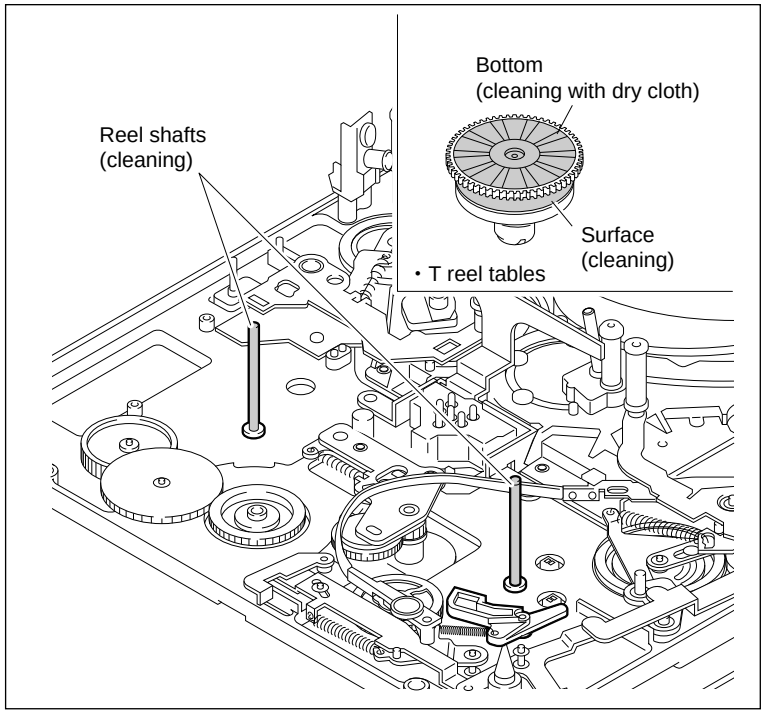
Clean the reel shaft with a cleaning cloth moistened with a cleaning fluid.

5. Reel table cleaning

(1) Clean the surface of the reel table, that the tension regulator band or S brake contact, with a cleaning cloth moistened with a cleaning fluid.
(2) Wipe the bottom of the T reel table with a dry cloth.

6. Reel table installation (1)

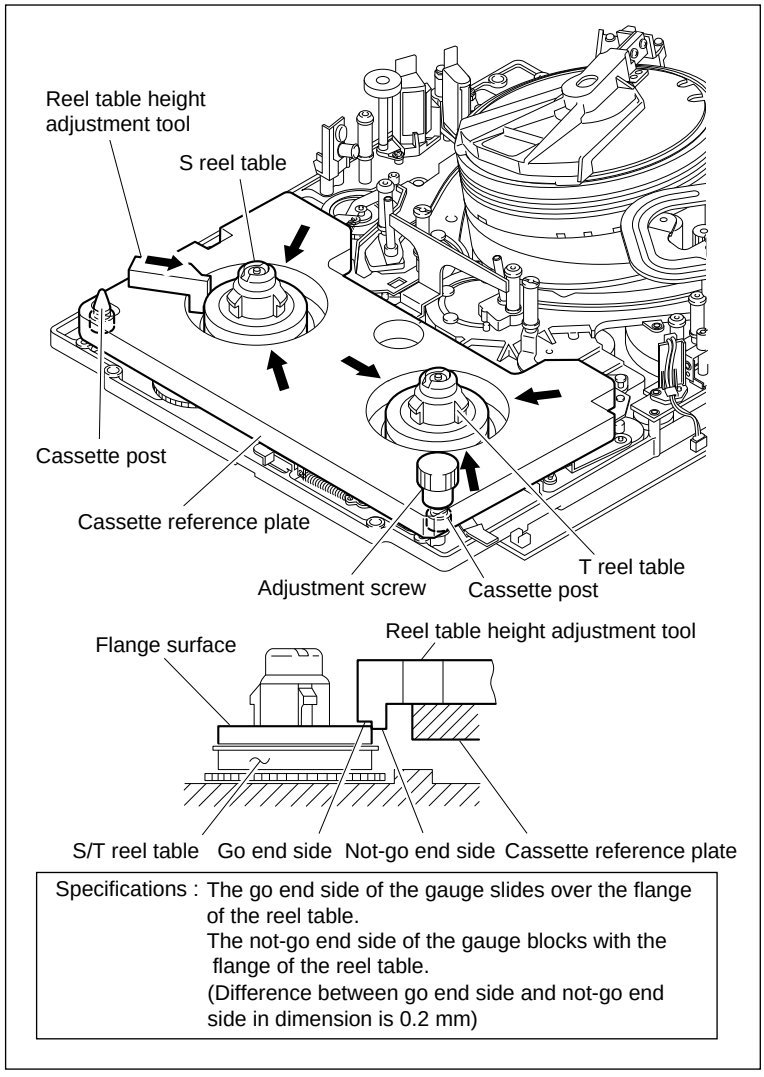
Slide the reel table onto the reel shaft while releasing the tension regulator band assembly and T soft brake arm or S main brake with a finger.



7. Reel table height adjustment

(1) Place the cassette reference plate on the two cassette posts, and then attach it as shown in the figure.
Turn the adjustment screw of the cassette reference plate and adjust to fit the plate on the mechanical deck, not to rattle.
(2) Move the reel table height adjustment tool to the flange surface of the S and T reel tables at intervals of 120 degrees shown in the figure, and check that the specifications are satisfied. If the specifications are not satisfied, adjust according to the following step (3).
(3) Adjust the reel table height by increasing or decreasing the number of poly-slider washers under the reel table.
When the reel table height is lower than the specifications;
Insert the poly-slider washers that is at the top of the reel table onto the bottom of the reel table.
When the reel table height is higher than the specifications ;
Insert the poly-slider washers that is at the bottom of the reel table onto the top of the reel table.

And then, recheck the specifications.


Reel table height
adjustment tool
S reel table
Cassette post
Cassette reference plate
Adjustment screw
Cassette post
T reel table
Reel table height adjustment tool
Flange surface
S/T reel table
Go end side
Not-go end side
Cassette reference plate
Specifications : The go end side of the gauge slides over the flange of the reel table.
The not-go end side of the gauge blocks with the flange of the reel table.
(Difference between go end side and not-go end side in dimension is 0.2 mm)

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8. Reel table installation (2)

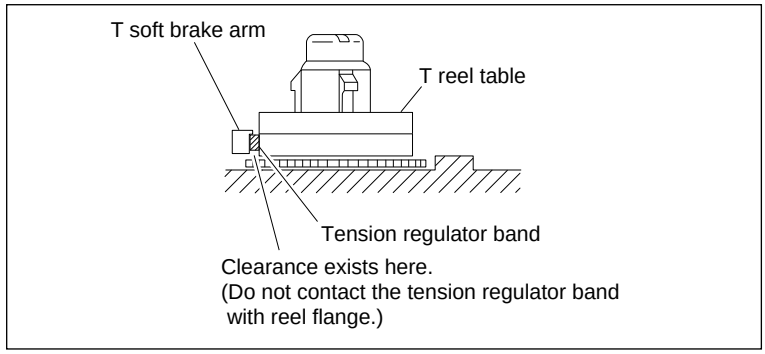
(1) Secure the reel table using a screw.
(2) Check the vertical play of the reel table by moving it up and down.

9. Tension regulator band assembly reinstallation (when T reel table was replaced)

Put the hook of the tension regulator band assembly removed in procedure 1 onto the shaft on the band adjustment bracket, and then fasten it using a new stop washer.

Notes

- Be careful not to bend or damage the tension regulator band assembly during reinstallation.
- Check the clearance exists between the tension regulator band assembly and the flange of the reel table around the T soft brake shoe shown in the figure, after reinstallation.


T soft brake arm
T reel table
Tension regulator band
Clearance exists here.
(Do not contact the tension regulator band with reel flange.)

10. S brake assembly reinstallation (when S reel table was replaced)

Reattach the S brake assembly.
(Refer to Section 5-11.)

11. Operation check

(1) Put the unit into the unthreading end state.
(2) Rotate the reel table while releasing the T soft brake or S main brake with a finger, and then check that the reel table and idler rotate smoothly.

Adjustment after replacement

12. FWD back tension adjustment (when S reel table was replaced)

(Refer to Section 7-3-1.)

13. REV back tension adjustment (when T reel table was replaced)

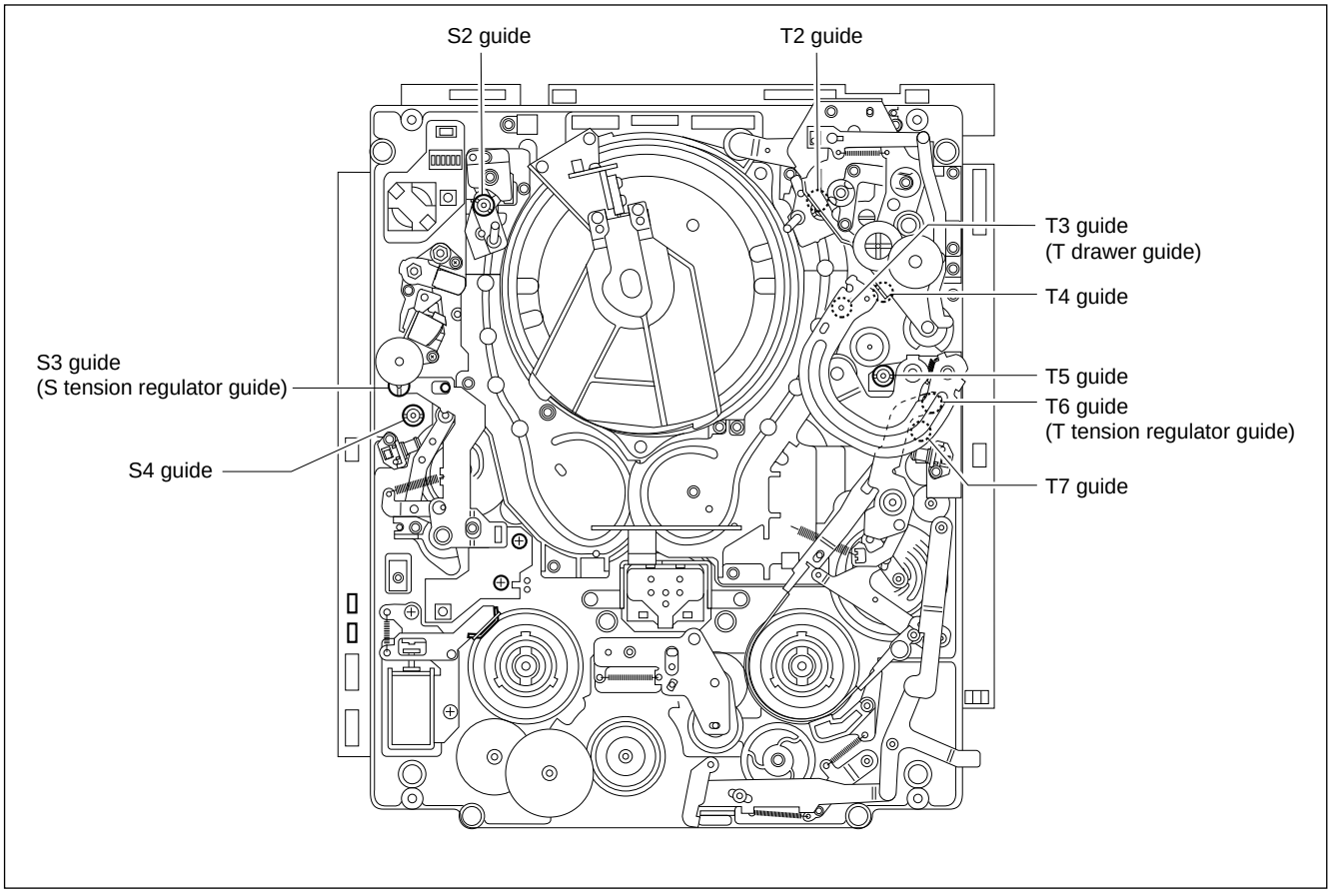
(Refer to Section 7-3-2.)

14. Tape running adjustment

(Refer to Section 7-4.)

6-7. Tape Guide Replacement

The replacement procedures of the following tape guides are described in this section.



Outline

Replacement

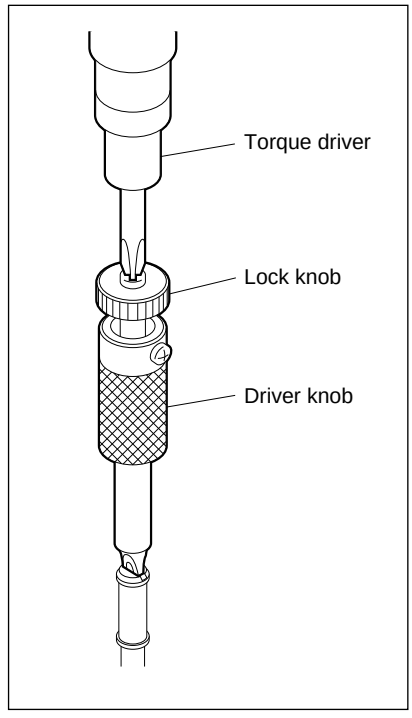
Tape guide removal
Tape guide installation

Adjustment after replacement

Tape guide height tentative adjustment
Tape running adjustment

Precautions

- Even though the multiple tape guides replacement are necessary, replace the tape guide one by one. Be sure to perform the tape running adjustment after each tape guide replacement is completed.
  If the multiple tape guides are replaced at the same time, it is very difficult to perform the tape running adjustment. Then, do not perform the multiple tape guides replacement at the same time.
- Tighten the setscrew at the top of the tape guide with the following tightening torque.
  9×10^{-2} N•m {0.9 kgf•cm}
  How to tighten the setscrew with specified tightening torque:
  Set the torque screwdriver to the specified tightening torque.
  Set the torque screwdriver tip to the philips type screw on top of the tape guide adjustment driver as shown in the figure, and then tighten the setscrew using the torque screwdriver.



Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)

Tools

- Tape guide adjustment driver (45) : J-6322-420-A
- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01

Note

If the tape guide adjustment driver tip is broken, it is recommended to repair by using the following spare bit.

- Spare bit (0.89 mm) : J-6322-420-3

Replacement

1. Tape guide removal

Note

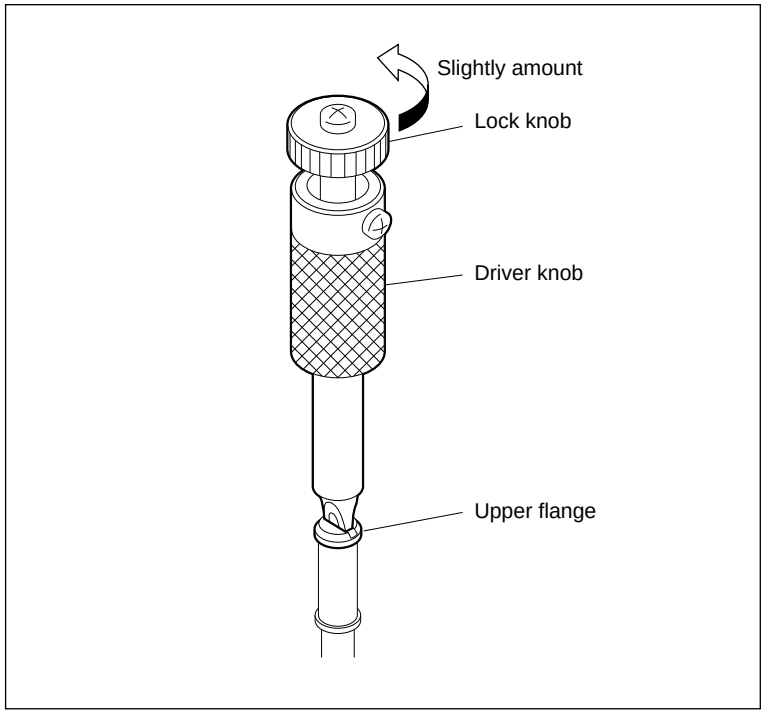
When replacing the T3 tape guide (T drawer guide), remove the pinch arm assembly first. (Refer to Section 5-7.)

(1) Set the tape guide adjustment driver on top of the upper flange as shown in the figure.
(2) Loosen the setscrew by turning the driver knob counterclockwise a slightly amount.

Note

As for the S3 guide (S tension regulator guide), T3 guide (T drawer guide), and T6 guide (T tension regulator guide), do not loosen the setscrew for these guides because it is dificult to adjust their height. As to other tape guides, when replacing the tape guide roller only, it is recommended to loosen the setscrew a slightly amount for easy height adjustment.

(3) Turn the driver knob counterclockwise, and then remove the upper flange from the tape guide shaft.
(4) Pull the guide roller out from the shaft. The lower flange and compression spring can be removed.



2. Tape guide installation

(1) Slide the compression spring and two washers onto the guide shaft as shown in the figure.

(2) Pass the lower flange through the guide shaft.

(3) Pass the guide roller through the guide shaft.

Notes

- For S2 and T2 guide rollers:
  Put the black marking on the guide roller up as shown in the figure.
- For S3 and T6 guide rollers:
  Put the step inside the guide roller down as shown in the figure.
- For T3 guide roller:
  Put the black marking on the guide roller down as shown in the figure.

(4) Screw the setscrew to the upper flange.

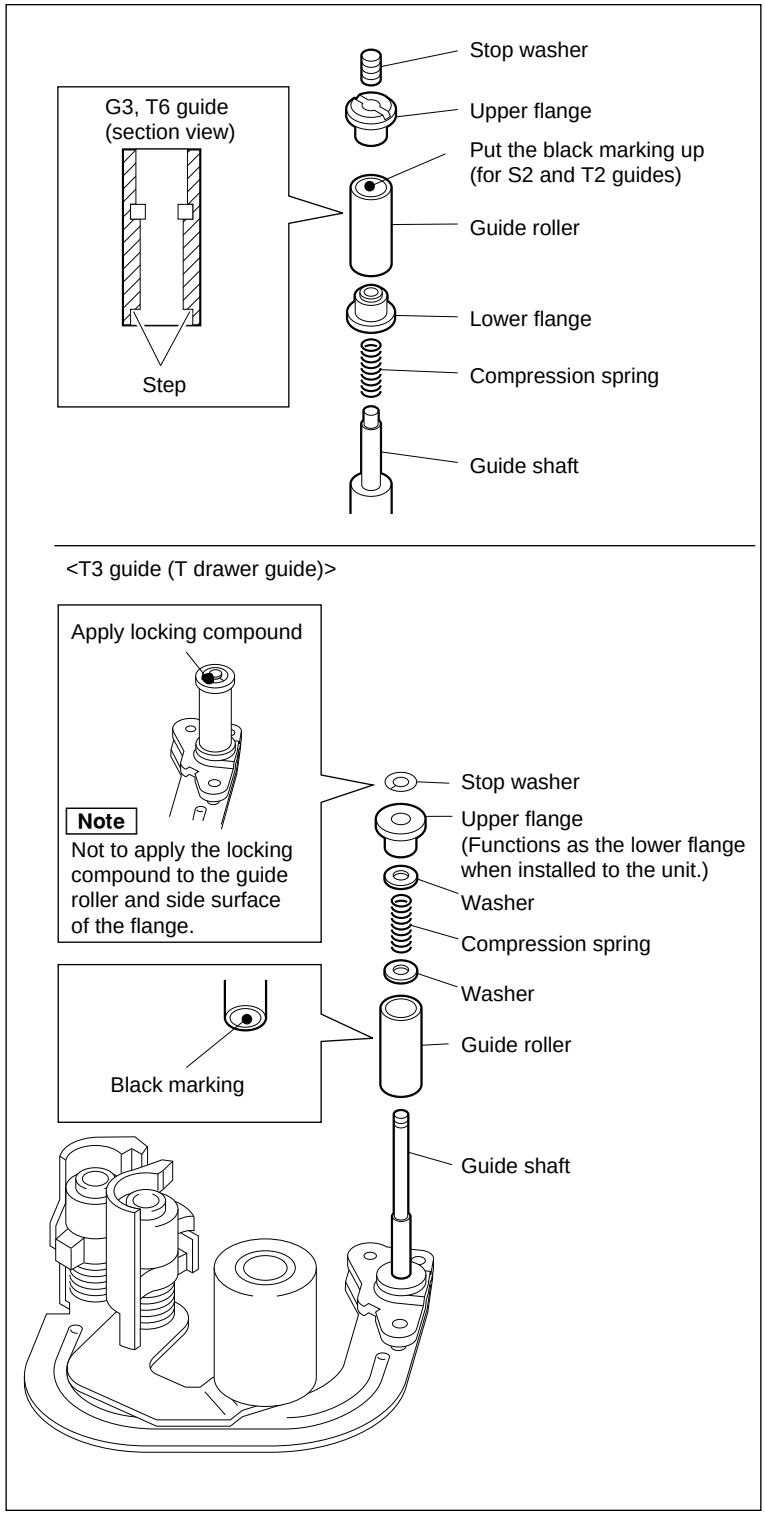
Note

It is not necessary to perform this step when the upper flange and setscrew are re-used.

(5) Turn the upper flange clockwise, and thread it to the guide shaft.

Notes

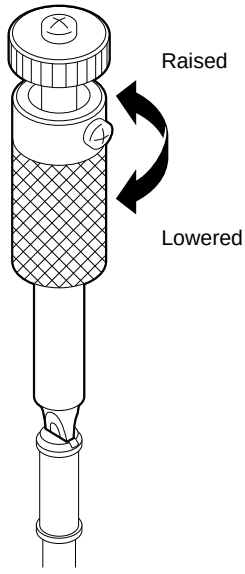
- After the T3 guide (T drawer guide) is replaced, apply the locking compound to the top of the T3 guide shaft, stop washer and T3 lower flange as shown in the figure. Do not run the tape within 30 minutes after applying the locking compound.
- Be careful not to apply the locking compound to the tape running surface of the tape guide roller and the side surface of the flange.



Adjustment after replacement

3. Tape guide height tentative adjustment

(1) Turn on the power.
(2) Insert the commercially available cassette tape into the unit, and then put the unit into the PLAY state at the beginning portion of the tape.
(3) Adjust the replaced tape guide height using the tape guide adjustment driver to meet the specifications.
(4) Tighten the setscrew with specified tightening torque.
Tightening torque : 9×10^{-2} N•m
{0.9 kgf•cm}



4. Tape running adjustment

(Refer to Section 7-4.)

Specifications :

- **S2 guide**
  Tape runs in contact with the upper flange.
- **S3 guide (S tension regulator guide)**
  Tape runs without contacting the upper and lower flanges.
  If the tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.
- **T2 guide**
  Tape runs in contact with the upper flange.
- **T3 guide (T drawer guide)**
  Tape runs in contact with the lower flange.
  If tape curl occurs, tape curl is acceptable within the range of less than 1/10 of the tape width.
- **T4 guide**
  Tape runs without contacting the upper and lower flanges.
  Even if the tape runs in contact with the upper or lower flange, tape curl could not be acceptable.
- **T6 guide (T tension regulator guide)**
  Tape runs without contacting the upper and lower flanges.
  If tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.
- **T7 guide**
  Even if the tape runs without contacting this tape guide roller, it is acceptable.

6-8. Pinch Press Cam Replacement

Outline

Replacement

T drawer sub assembly removal
VH cleaner assembly removal
Tape guard removal
Pinch press cam removal
Pinch press cam installation/phase adjustment
Pinch press cam fixing
Tape guard reinstallation
VH cleaner assembly reinstallation
T drawer sub assembly reinstallation

Check after replacement

Operation check

Precaution

The following new stop washer and E ring are required when replacing the pinch press cam.

Stop washer : 3-559-408-11
E ring : 7-624-105-04

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

- Stop washer fastening tool : J-6323-530-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Parallel pin (d = 1.6 mm) : 3-649-266-01
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01
- Grease (PG-662) : 7-651-000-59
- Tweezers

Replacement

1. T drawer sub assembly removal

Remove the T drawer sub assembly.
(Refer to Section 5-7.)

2. VH cleaner assembly removal

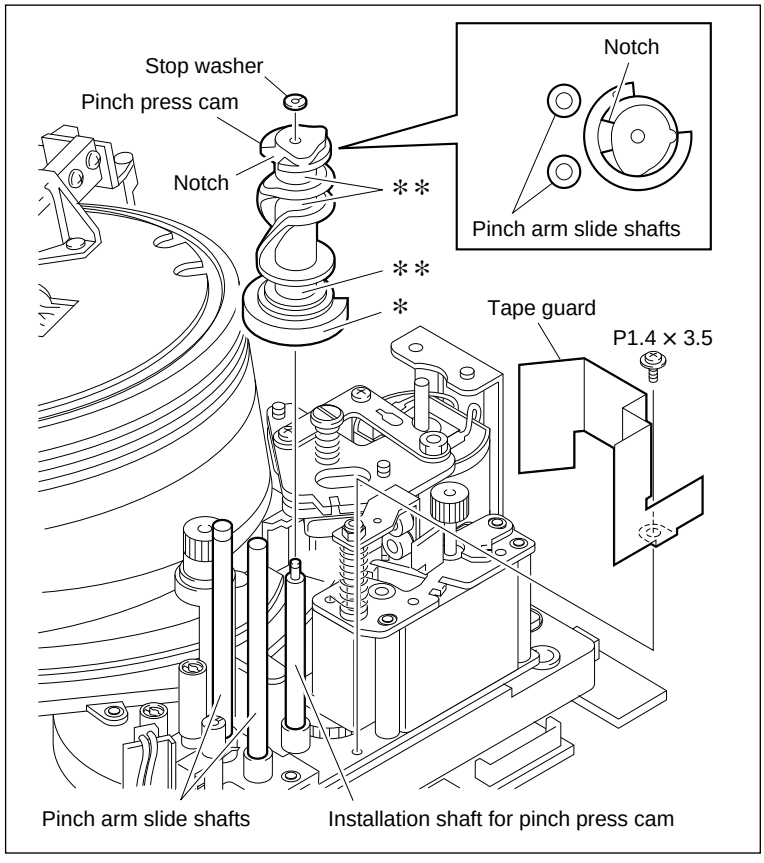
Remove the VH cleaner assembly.
(Refer to Section 5-6.)

3. Tape guard removal

Remove the one screw to remove the tape guard.

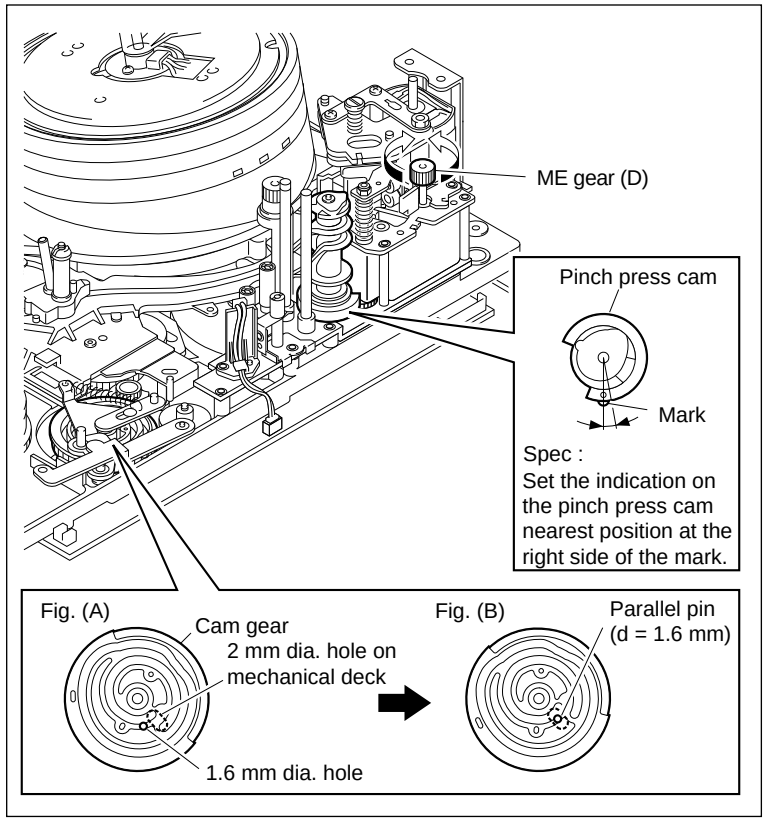
4. Pinch press cam removal

(1) Remove the stop washer using tweezers, and then remove the pinch press cam.
(2) Clean the installation shaft of the pinch press cam with a cleaning cloth moistened with a cleaning fluid.
(3) Apply grease of two grains in the size of 3 mm dia. to the ∗-marked portion of a new pinch press cam shown in the figure. Similarly, apply grease of five grains to the whole circumference of the ∗∗-marked cam groove.
(4) Attach the pinch press cam onto the shaft while facing the notch of the pinch press cam in the direction shown in the figure.



5. Pinch press cam installation/phase adjustment

(1) Turn the ME gear (D) on the gear box clockwise until the positioning hole (1.6 mm) of the S cam gear and the reference hole of the mechanical deck are located as shown in figure (A).
(2) Turn the ME gear (D) counterclockwise until the cam gear hole and mechanical deck hole are located as shown in figure (B), and then insert a parallel pin (d = 1.6 mm) into these holes.
(3) Turn the ME gear (D) counterclockwise again with the parallel pin inserted.
Check to see that the position of the mark of the pinch press cam and the mark of the drawer base bracket satisfy the specifications when the cam gear operation stops. If the specifications are not satisfied, lift the pinch press cam slightly up and shift the engagement of each tooth.
(4) Pull the parallel pin (d = 1.6 mm) out .


ME gear (D)
Pinch press cam
Mark
Spec :
Set the indication on the pinch press cam nearest position at the right side of the mark.
Fig. (A)
Cam gear
2 mm dia. hole on mechanical deck
1.6 mm dia. hole
Fig. (B)
Parallel pin (d = 1.6 mm)

6. Pinch press cam fixing

Fix the pinch press cam with a new stop washer.

7. Tape guard reinstallation

Reattach the tape guard, and fix it with the one screw.

8. VH cleaner assembly reinstallation

Reattach the VH cleaner assembly.
(Refer to Section 5-6.)

9. T drawer sub assembly reinstallation

Reattach the T drawer sub assembly.
(Refer to Section 5-7.)

Check after replacement

10. Operation check

(1) Check that the pinch arm is smoothly moved downward and pressed against the capstan shaft when the manual eject knob is turned clockwise while pushing down.
(2) Check that the pinch arm is smoothly moved upward and put into the unthreading end state when the manual eject knob is turned counterclockwise.

6-9. S Tension Regulator Arm Assembly Replacement

Outline

Replacement

S tension regulator arm assembly removal
S tension regulator arm assembly installation
S tension regulator guide cleaning

Adjustment after replacement

S tension regulator offset/gain adjustment
Tape running adjustment

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section1-5.)

Tools

- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver bit's (for M1.4) : J-6325-110-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01

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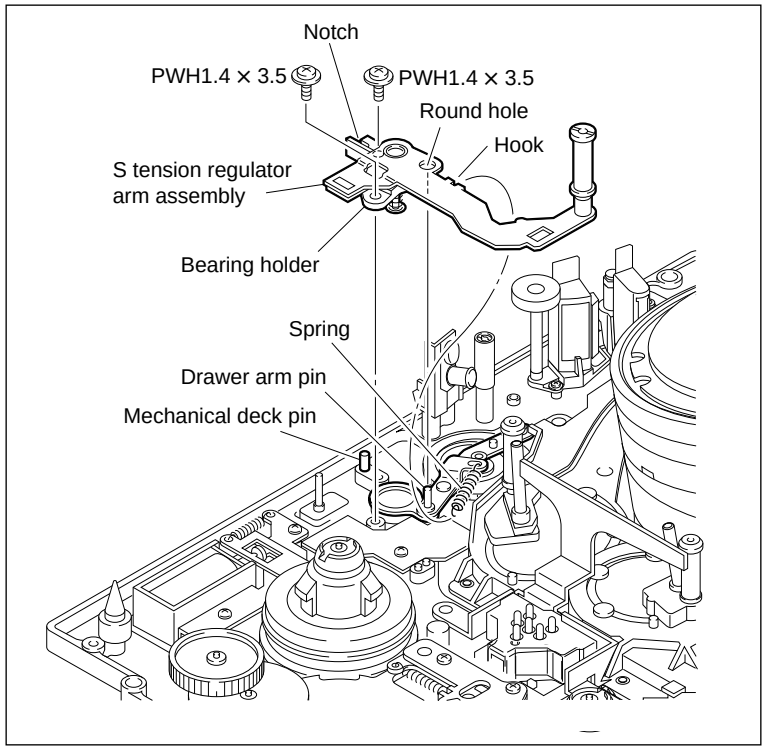
Replacement

1. S tension regulator arm assembly removal

(1) Remove the two screws fixing the bearing holder.
(2) Unhook the spring from the S tension regulator arm assembly shown in the figure, and then remove the S tension regulator arm assembly.



2. S tension regulator arm assembly installation

(1) Align the large round hole of the drawer arm with the round hole of the mechanical deck.
(2) Set the S tension regulator arm assembly on the mechanical deck so that the drawer arm pin is put onto the round hole and the mechanical deck pin is inserted into the notch of the bearing holder, and then attach it with the two screws.
(3) Hook the spring removed in procedure 1.

3. S tension regulator guide cleaning

(1) Clean the guide roller of the S tension regulator arm assembly with a cleaning cloth moistened with a cleaning fluid.
(2) After cleaning, wipe with a dry cloth.

Adjustment after replacement

4. S tension regulator offset/gain adjustment

(Refer to Section 7-2.)

5. Tape running adjustment

(Refer to Section 7-4.)

6-10. T Tension Regulator Arm Assembly Replacement

Outline

Replacement

T tension regulator arm assembly removal
T tension regulator arm assembly installation
T tension regulator guide cleaning

Adjustment after replacement

REV back tension adjustment
Tape running adjustment

Precaution

The following new stop washer is required when replacing the T tension regulator arm assembly.
Stop washer : 3-559-408-11

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

- Stop washer fastening tool : J-6323-530-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01
- Tweezers

Replacement

1. T tension regulator arm assembly removal

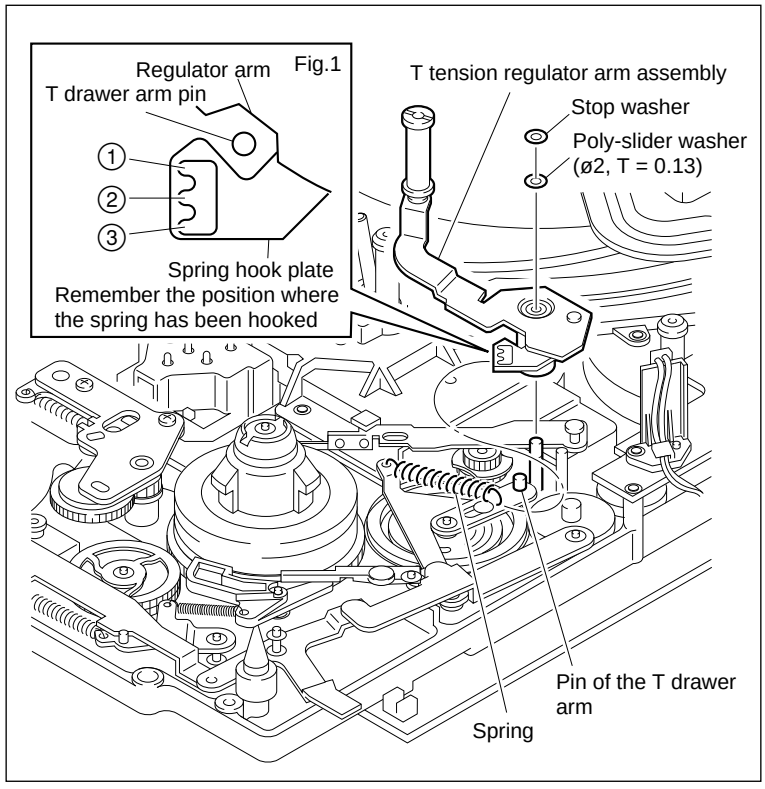
(1) Unhook the spring of the tension regulator arm shown in the figure.
At that time, remember the position where the spring has been hooked.
(2) Remove the stop washer and poly-slider washer using tweezers, then remove the T tension regulator arm assembly.

2. T tension regulator arm assembly installation

(1) Slide a new T tension regulator arm assembly onto the shaft so that the pin of the T drawer arm is put between the spring hook plate and regulator arm of the T tension regulator arm assembly, and then secure it with the poly-slide washer and a new stop washer.
(2) Hook the spring removed in step (1) of procedure 1 in the original position.

3. T tension regulator guide cleaning

(1) Clean the guide roller of the tension regulator arm assembly with a cleaning cloth moistened with a cleaning fluid.
(2) After cleaning, wipe with a dry cloth.



Adjustment after replacement

4. REV back tension adjustment

(Refer to Section 7-3-2.)

5. Tape running adjustment

(Refer to Section 7-4.)

6-11. T Idler Assembly Replacement

Outline

Replacement

Spring removal
Eject link assembly/release arm assembly removal
T idler assembly removal
T idler assembly installation
Eject link assembly/release arm assembly reinstallation
Spring reinstallation

Check after replacement

Operation check

Precaution

The following new stop washer is required when replacing the T idler assembly.
Stop washer : 3-559-408-11 (4 pcs)

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

- Stop washer fastening tool : J-6323-530-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Oil : 7-661-018-18
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01
- Tweezers

Replacement

1. Spring removal

Unhook the two springs of the gear connecting arm assembly side shown in the figure.

2. Eject link assembly/release arm assembly removal

Remove the two stop washers fastening the eject link assembly and one stop washer fastening the release arm assembly using tweezers, and then remove the eject link and release arm assemblies from the mechanical deck.

3. T idler assembly removal

Remove the stop washer using tweezers, and then remove the T idler assembly.

Note

If poly-slider washer (0.25 thickness : 3-303-961-11) may cling to the bottom of the T idler assembly and remove together, return the poly-slider washer onto the shaft.

4. T idler assembly installation

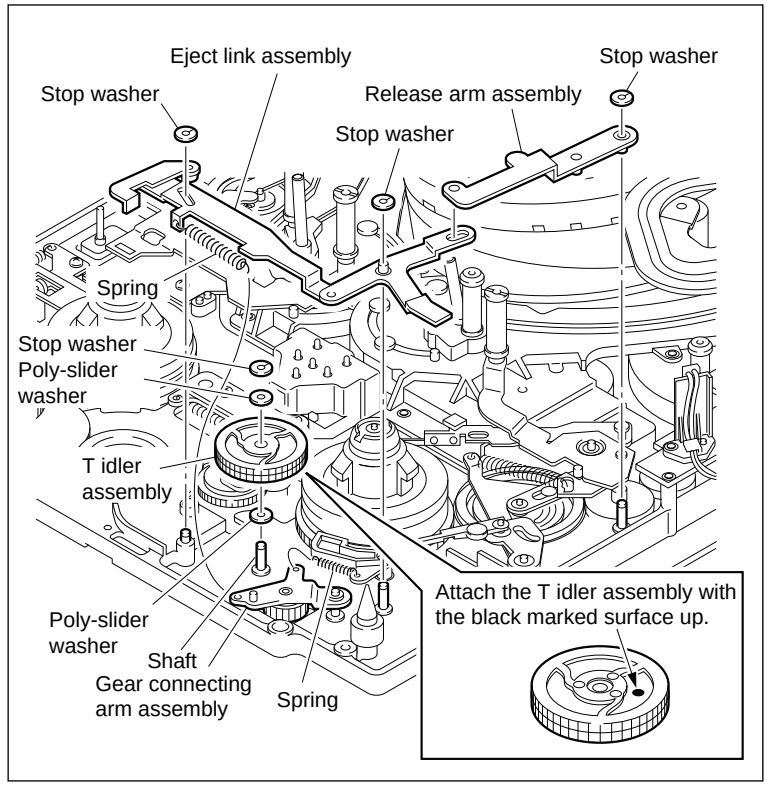
(1) Clean the installation shaft with cleaning cloth moistened with cleaning fluid.
(2) Apply a 1/4 drop of oil to the installation shaft.
(3) Attach a new T idler assembly onto the shaft with the black marked surface shown in the figure up.
(4) Attach the polywasher (0.13 thickness : 3-303-961-01).
(5) Attach a new stop washer.

5. Eject link assembly/release arm assembly reinstallation

Reattach the eject link and release arm assemblies using the three new stop washers.

6. Spring installation

Hook the two springs removed in procedure 1 on the gear connecting arm assembly.



Check after replacement

7. Operation check

Insert the cassette tape and check that the PLAY, F-FWD, and REW functions are properly operated.

6-12. Cam Gear Assembly Replacement

Outline

Replacement

S cam gear positioning
T tension regulator arm assembly removal
Tension regulator band removal
Release arm assembly removal
T tension drawer arm assembly removal
Cam gear assembly removal
Cam gear assembly installation
T tension drawer arm assembly reinstallation
Release arm assembly reinstallation
Tension regulator band reinstallation
T tension regulator arm assembly reinstallation
Parallel pin removal

Adjustment after replacement

Tape running check
REV back tension check

Precaution

The following new stop washers (five pieces) are required when replacing the cam gear assembly.
Stop washer : 3-559-408-11

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

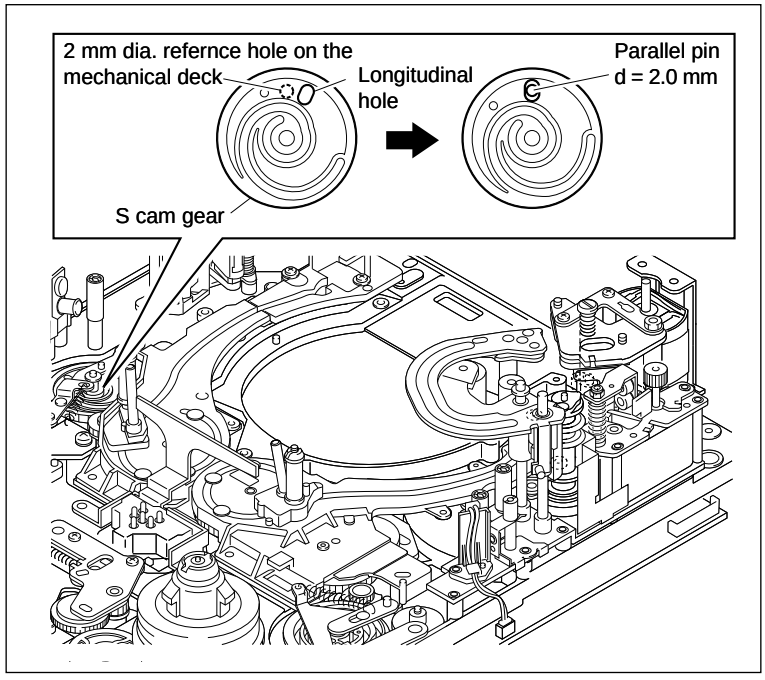
Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Stop washer fastening tool : J-6323-530-A
- Parallel pin (d = 2.0 mm) : 3-703-358-04
- Cleaning cloth (15 × 15) : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Oil : 7-661-018-18
- Grease (PG-662) : 7-651-000-59
- Tweezers

Removal

1. S cam gear positioning

Turn the S cam gear counterclockwise with a finger to align the longitudinal hole of the S cam gear with the reference hole (2.0 mm) on the mechanical deck. And then insert the parallel pin (d = 2.0 mm) into these holes.



2. T tension regulator arm assembly removal

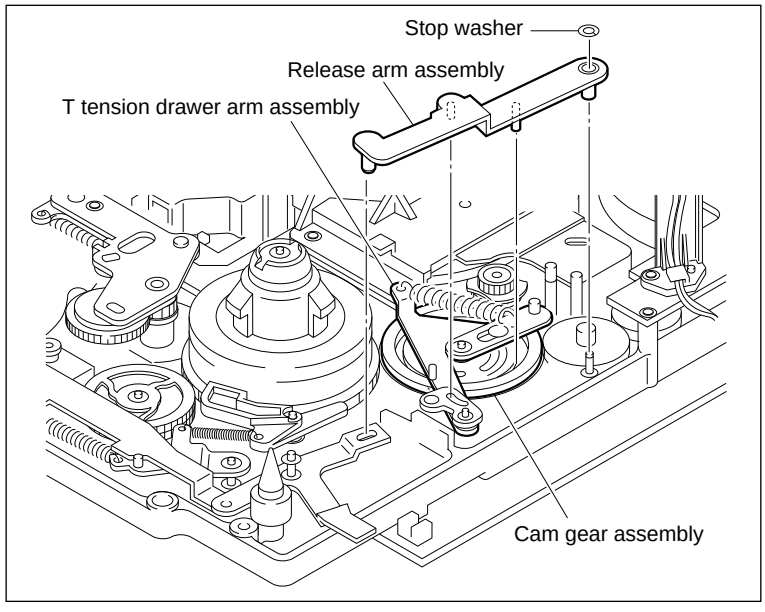
Remove the T tension regulator arm assembly. (Refer to Section 5-9.)

3. Tension regulator band removal

Remove the tension regulator band. (Refer to Section 5-9.)

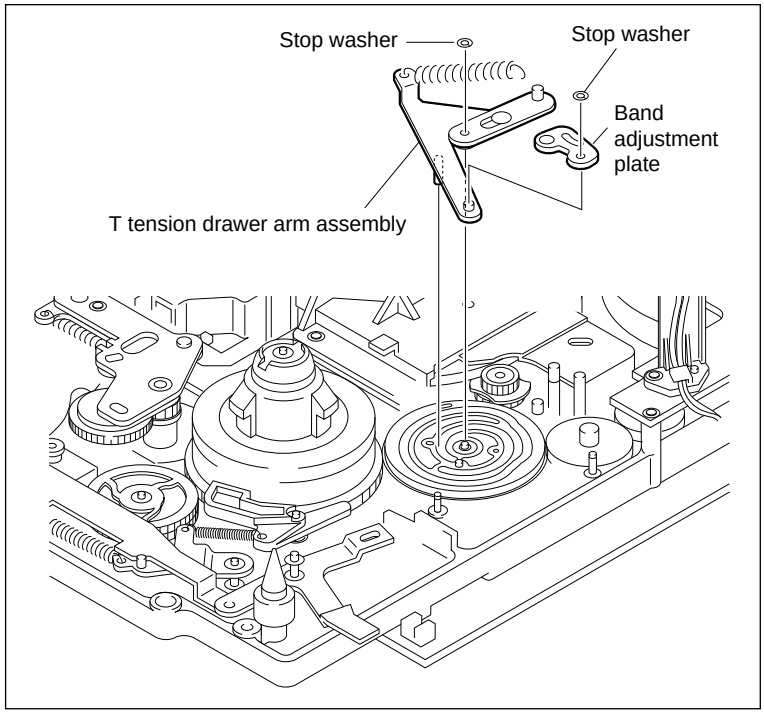
4. Release arm assembly removal

Remove the stop washer to remove the release arm assembly.



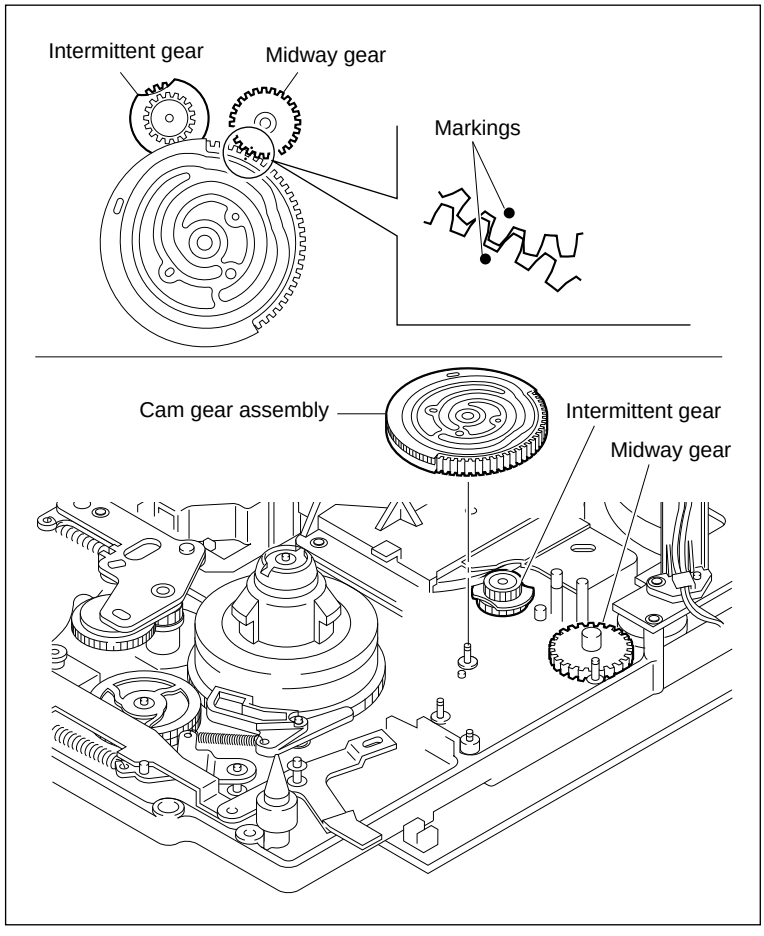
5. T tension drawer arm assembly removal

(1) Remove the stop washer, and then remove the band adjustment plate.
(2) Remove the stop washer, and then remove the T tension drawer arm assembly.



6. Cam gear assembly removal

(1) Make either of the tooth of the cam gear assembly and the tooth of the midway gear which are meshed each other, using tweezers.
(2) Remove the cam gear assembly.



Installation

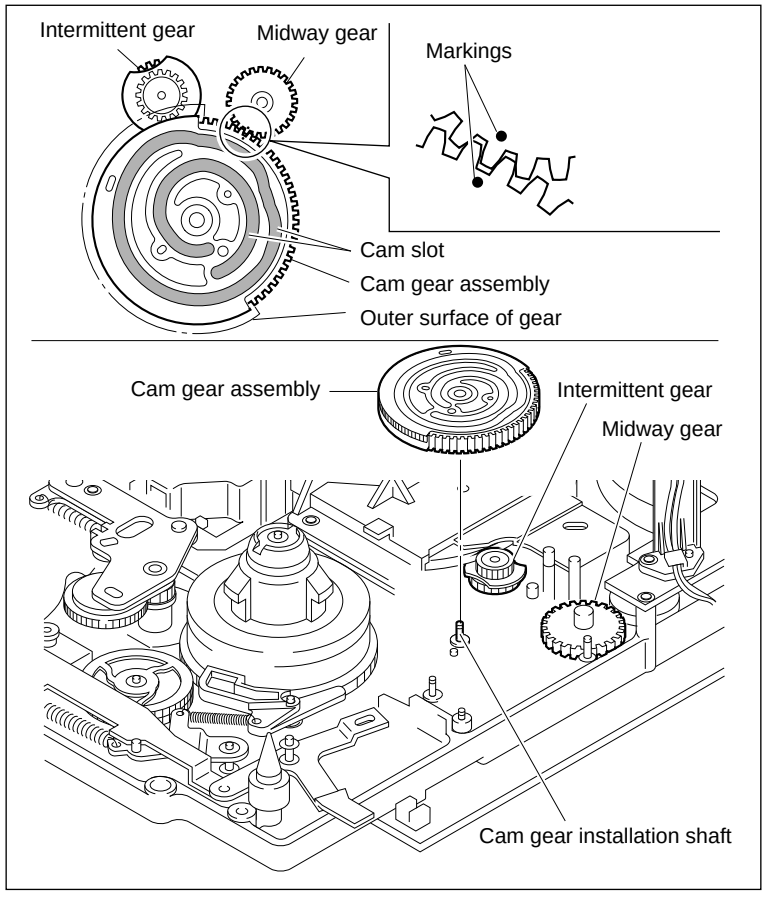
7. Cam gear assembly installation

(1) Apply one-quarter of a drop of oil to the shaft of the cam gear assembly.
(2) Make the tooth of a new cam gear assembly in the same position as the marked position of the removed cam gear assembly.
(3) Peel off the protective seal on the reflective seal surface of the new cam gear assembly. And then clean the peeled-off portion of the reflector with a cleaning fluid.

Note

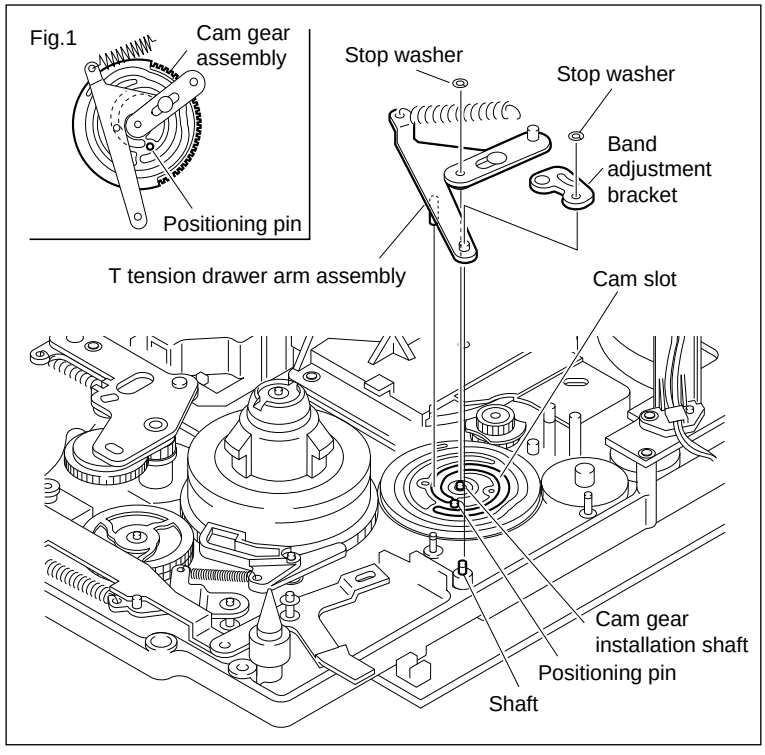
Be careful not to contact and damage the reflective seal surface.

(4) Apply a light coating of grease to the outer surface of the cam gear assembly and inside of the cam slot as shown in the figure.
(5) Attach the cam gear assembly while lining up the mark of the cam gear assembly with the mark of the midway gear.



8. T tension drawer arm assembly reinstallation

(1) Fit the T tension drawer arm assembly onto the cam gear installation shaft, cam slot, and pin of chassis. And then secure the T tension drawer arm assembly using a new stop washer as shown in the Fig-1.
(2) Reattach the band adjustment plate using a new stop washer.

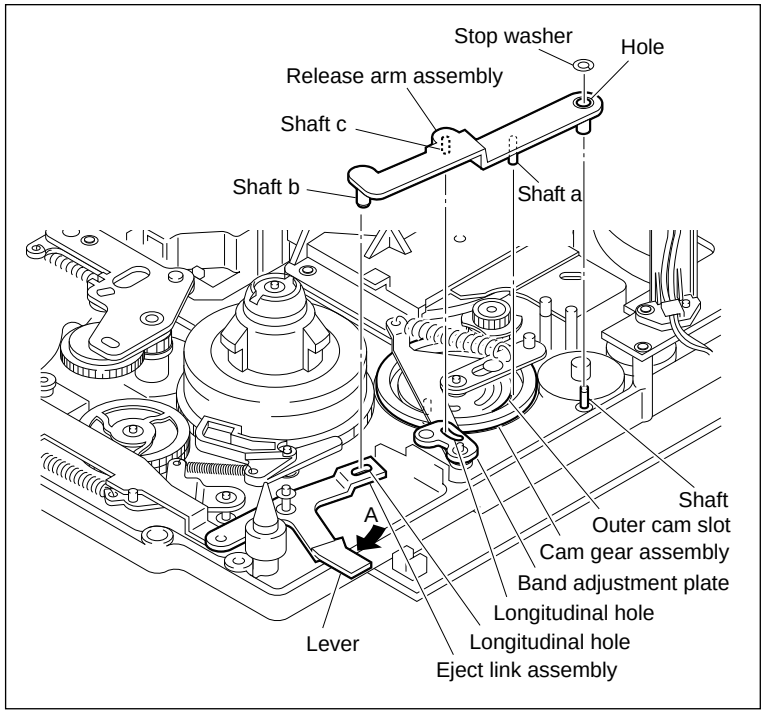


9. Release arm assembly reinstallation

Align the hole and shafts a, b, and c of the release arm assembly with the pin, outer slot of cam gear, longitudinal hole of the eject link assembly, and the longitudinal hole of the band adjustment plate. And then, secure the release arm assembly with a stop washer.

Note

Pull the lever in the direction of the arrow A to align and insert the shaft b into the longitudinal hole of the eject link assembly.



10. Tension regulator band reinstallation

Secure the tension regulator band using a new stop washer. (Refer to Section 5-9.)

11. T tension regulator arm assembly reinstallation

Secure the T tension regulator arm assembly using a new stop washer. (Refer to Section 5-9.)

12. Parallel pin removal

Remove the parallel pin from the S cam gear.

Adjustment after replacement

13. Tape running check

(Refer to Section 7-4.)

14. REV back tension check

(Refer to section 7-3-2.)

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6-13. Intermittent Gear Replacement

Outline

Replacement

Threading link assembly removal
Cam gear assembly removal
Intermittent gear replacement
Cam gear assembly reinstallation
Threading link assembly reinstallation

Check after replacement

Tape running check
REV back tension check

Precaution

The following new stop washer is required when replacing the intermittent gear.
Stop washer : 3-559-408-11

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

- Torque screwdriver’s bit (for M2) : J-6325-380-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Stop washer fastening tool : J-6323-530-A
- Parallel pin (d = 2.0 mm) : 3-703-358-04
- Cleaning cloth (15 × 15) : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Oil : 7-661-018-18
- Grease (PG-662) : 7-651-000-59
- Tweezers

Removal

1. Threading link assembly removal

Remove the threading link assembly.
(Refer to Section 6-5.)

2. Cam gear assembly removal

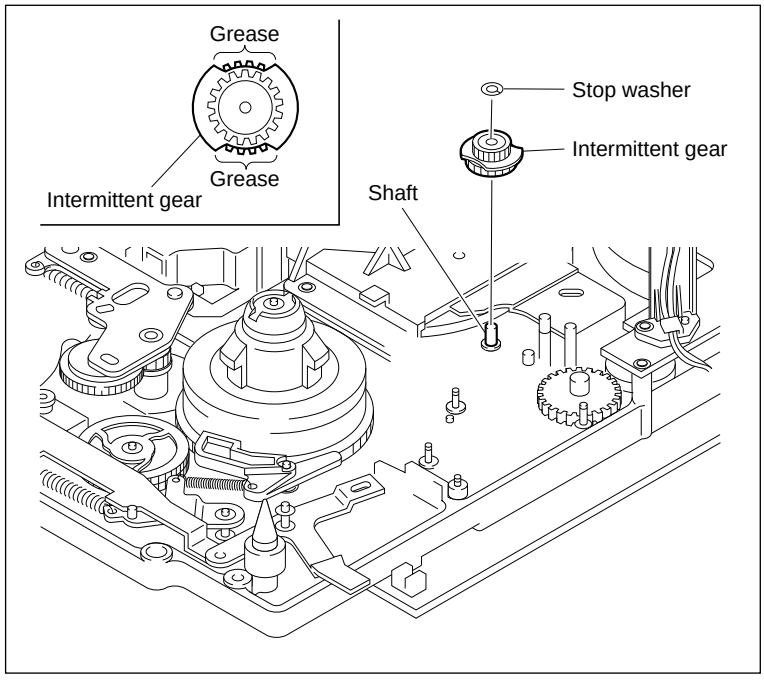
Remove the cam gear assembly.
(Refer to Section 6-12.)

Note

Make either of the cam gear assembly and the tooth of the midway gear which are meshed each other, using tweezers.

3. Intermittent gear replacement

(1) Remove the stop washer to remove the intermittent gear.
(2) Apply one-quarter of a drop of oil to the shaft of the intermittent gear.
(3) Apply a grain in the size of 3 mm dia. to each of the two points on the dented portions of the new intermittent gear.
(4) Attach the intermittent gear in the direction shown in the figure, and secure it using a new stop washer.

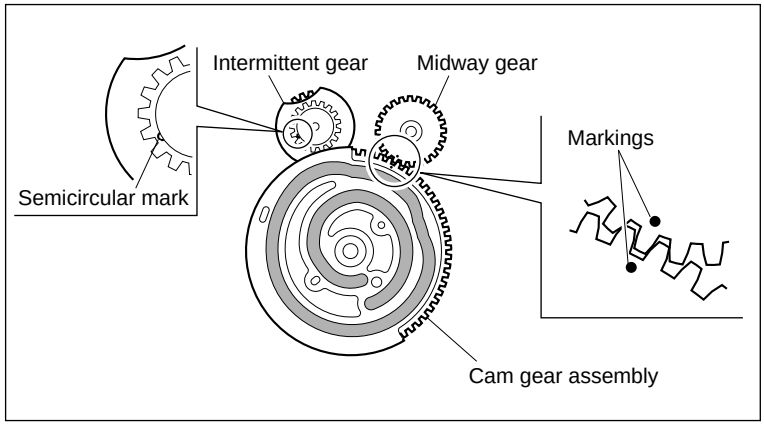


4. Cam gear assembly reinstallation

Reattach the cam gear assembly.
(Refer to Section 6-12.)
Reattach the cam gear while aligning the cam gear assembly to the dented portion of the intermittent gear.

5. Threading link assembly reinstallation

Reattach the threading link assembly.
(Refer to Section 6-5.)



Adjustment after replacement

6. Tape running check

(Refer to Section 7-4.)

7. REV back tension check

(Refer to Section 7-3-2.)

6-14. AT Head Replacement

Outline

Replacement

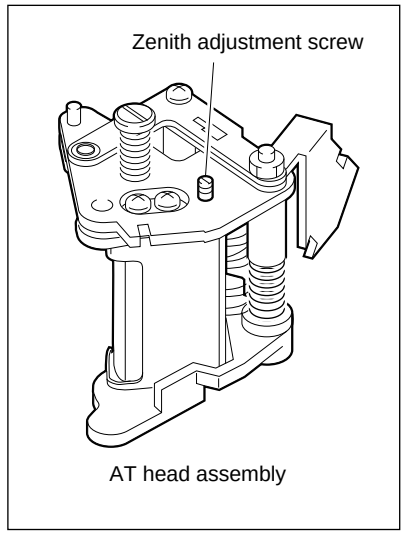
VH cleaner assembly removal
AT head assembly removal
AT head replacement
AT head assembly reinstallation
VH cleaner assembly reinstallation

Adjustment after replacement

Tape running adjustment
Video tracking adjustment
AT head height adjustment
CTL head position adjustment
AT head position adjustment
Electriccal adjustment after AT head replacement

Precautions

- Never tighten or loosen the zenith adjustment screw during the AT head replacement.
- The following harness clamp is required when replacing the AT head.
  Harness clamp : 3-837-356-02



AT head assembly

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

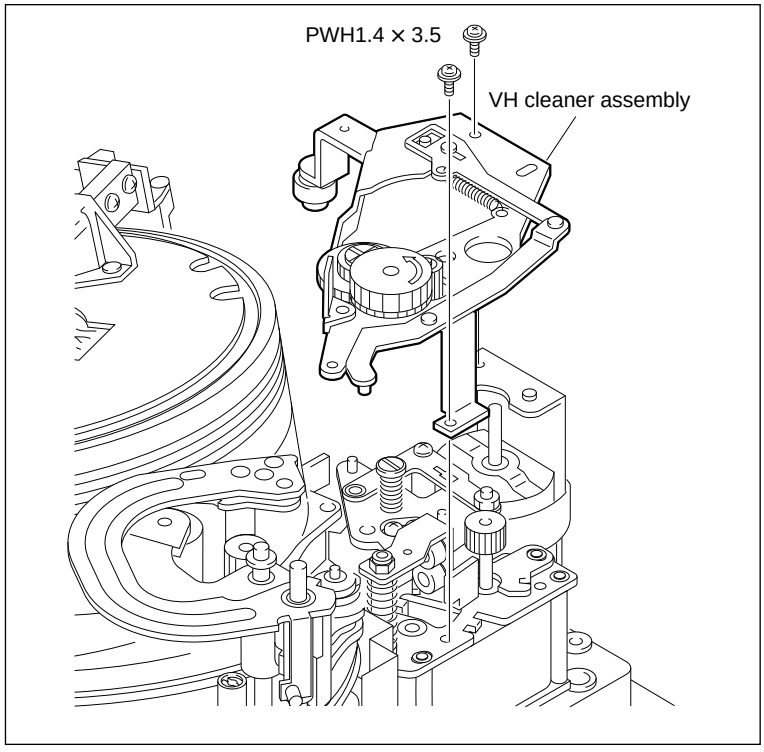
Tools

- Torque screwdriver bit's (for M1.4) : J-6325-110-A
- Torque screwdriver bit's (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01

Replacement

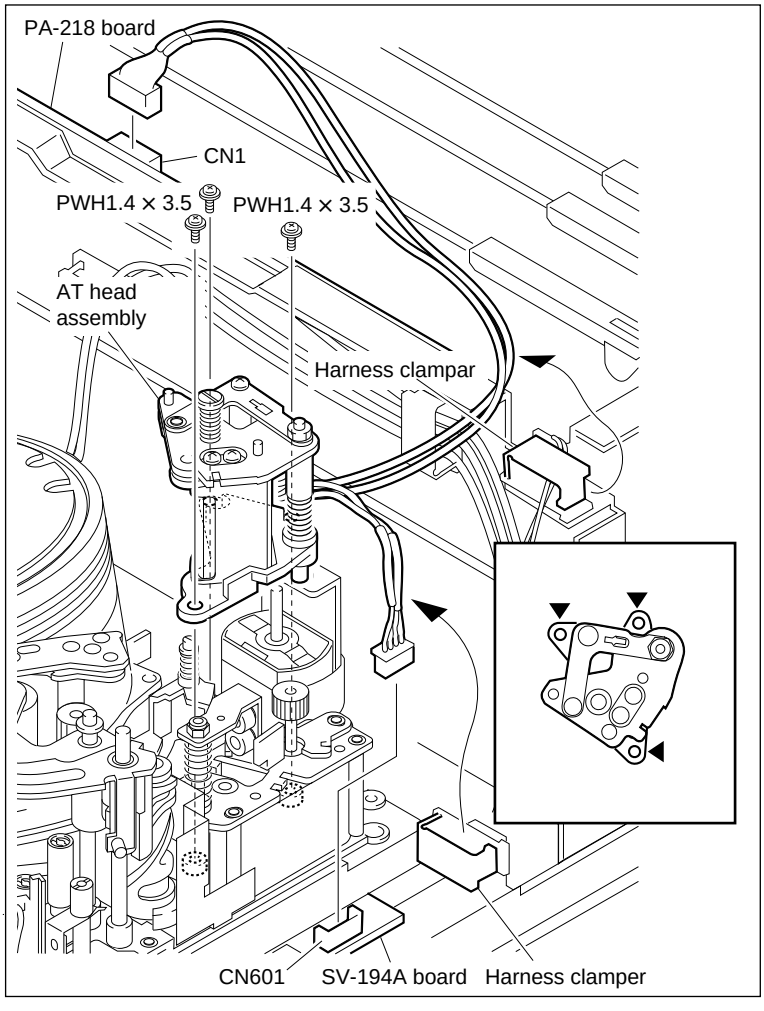
1. VH cleaner assembly removal

Remove the two screws, and then remove the VH cleaner assembly.



2. AT head assembly removal

(1) Unfasten the AT head harness from the harness clamp.
(2) Disconnect the harness connector of the AT head from connector CN601 on the SV-194A board.
(3) Disconnect the harness connector of the AT head from connector CN1 on the PA-218 board.
(4) Remove the three screws, then remove the AT head assembly.



3. AT head replacement

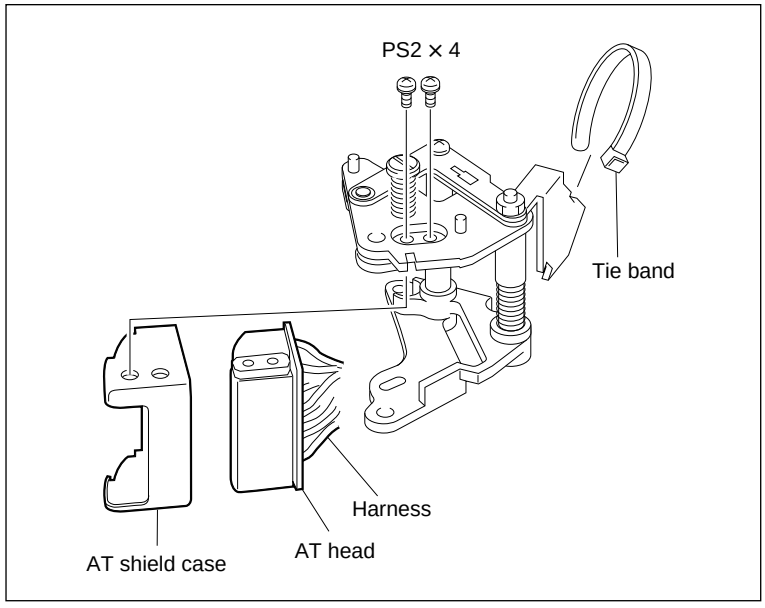
(1) Cut the tie band.

(2) Remove the two screws shown in the figure, and then remove the AT head and AT shield case.

(3) Unsolder the harness at the back of the AT head.

Reference

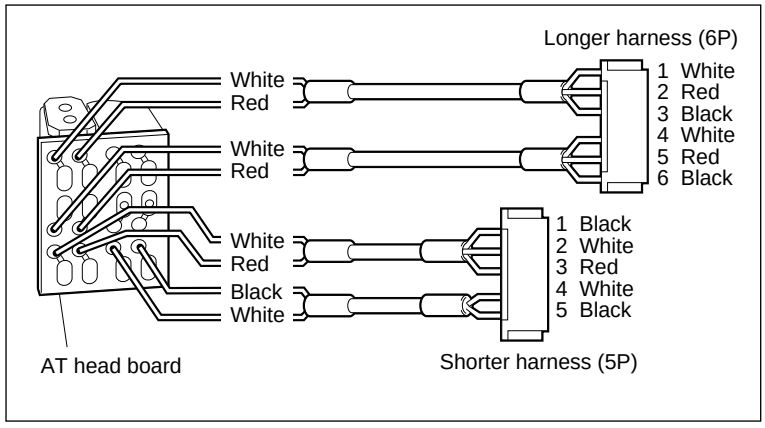
This harness is used again.



(4) Solder the harness removed in step (2) to the printed circuit board of a new AT head as shown in the figure.

Note

Be sure to solder the harness in a correct positions.



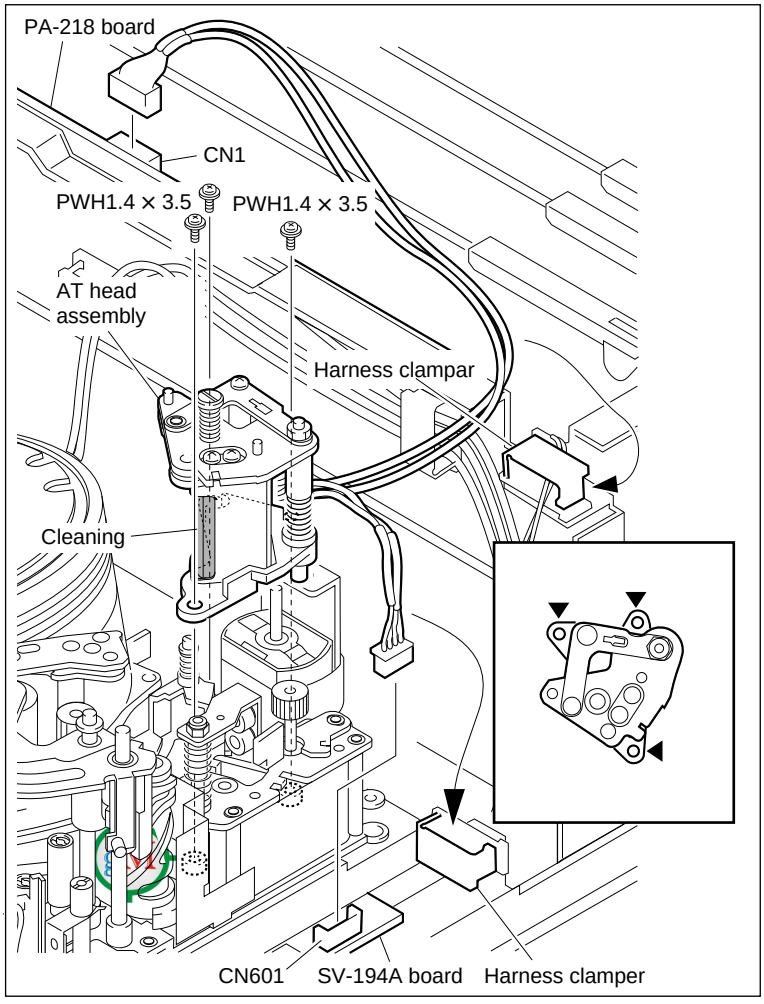
(5) Put the AT shield plate on the new AT head.

(6) Attach the AT head with the two screws.
Tightening torque : 20×10^{-2} N•m
{2.0 kgf•cm}

(7) Fasten the AT head harnesses to the A/T base using a new harness clamp.

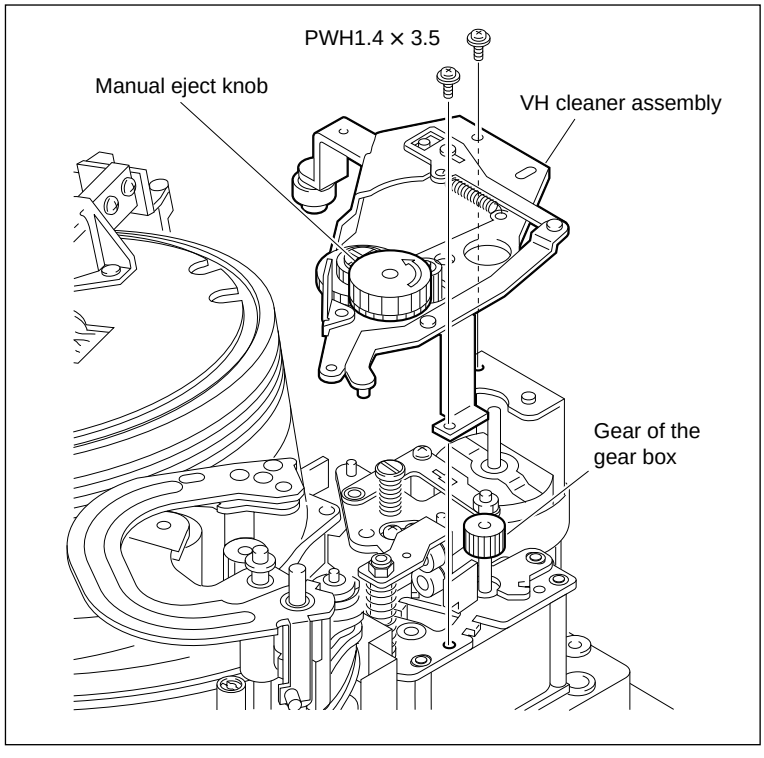
4. AT head assembly reinstallation

(1) Align the boss of the AT head assembly with the hole of the mechanical deck and attach it with the three screws.
(2) Connect the shorter harness of the AT head to connector CN601 on the SV-194A board, and then fasten it to harness clampers.
(3) Connect the longer harness of the AT head to connector CN1 on the PA-218 board.
(4) Fasten the harness connected to the PA-218 board to harness clamper.
(5) Clean the AT head surface with a cleaning cloth moistened with a cleaning fluid.



5. VH cleaner assembly reinstallation

(1) Reattach the VH cleaner assembly with the two screws.
Tightening torque : 9×10^{-2} N•m
{0.9 kgf•cm}
(2) Check that the gear of the VH cleaner assembly is engaged with the gear of the gear box when the manual eject knob is pushed down.



Adjustment after replacement

6. Tape running adjustment
(Refer to Section 7-4.)

7. Video tracking adjustment
(Refer to Section 7-5.)

8. AT head height adjustment
(Refer to Section 7-9.)

9. CTL head position adjustment
(Refer to Section 7-7.)

10. AT head position adjustment
(Refer to Section 7-8.)

11. Electrical adjustment after AT head replacement
(Refer to Sections 3-2 and 9-6.)

6-15. CTL Head Replacement

Outline

Replacement

CTL/FE head assembly removal
CTL head replacement
CTL/FE head assembly reinstallation
CTL/FE head cleaning

Adjustment after replacement

Tape running check
Video tracking adjustment
CTL head height adjustment
CTL head position adjustment
AT head position adjustment

CAUTION

Never contact the tape cleaner on the CTL/FE head block with bear hands.
The tape cleaner has a sharp edge. Pay careful attention to it when replacing or adjusting the CTL head.

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)

Tools

- Torque screwdriver bit (for M1.4) : J-6325-110-A
- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver's (3 kg•cm) : J-6325-400-A
- Cleaning cloth (15 × 15) : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Removal

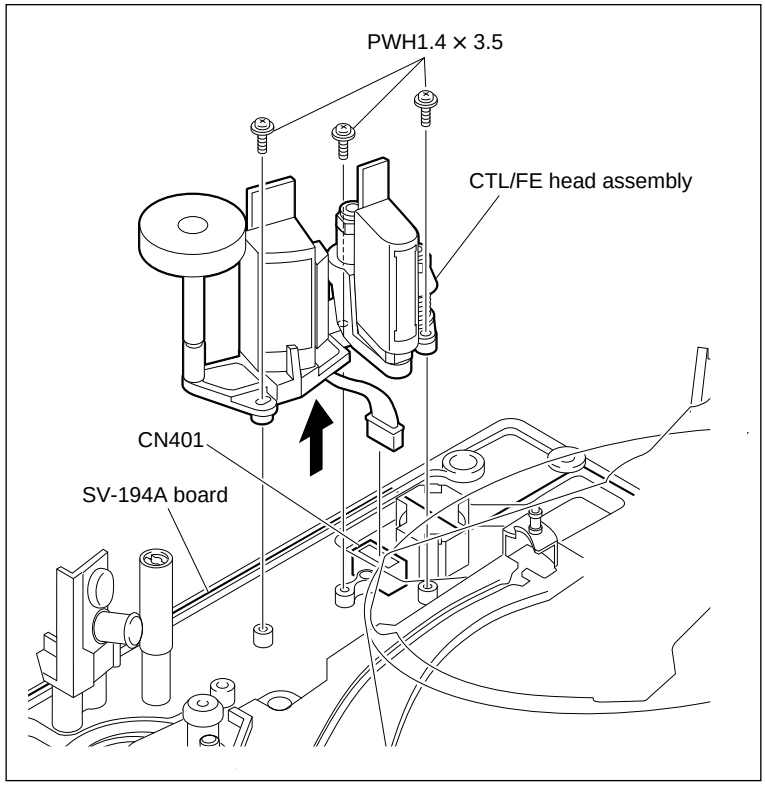
1. CTL/FE head assembly removal

(1) Disconnect the harness from the connector CN401 on the SV-194A board.

(2) Remove the three screws, and then remove the CTL/FE head assembly from the mechanical deck.

Note

Be careful not to damage the video heads, drum, full erase head, tape guide, and other parts with a screwdriver.



2. CTL head replacement

(1) Unsolder the two wires soldered to the head.

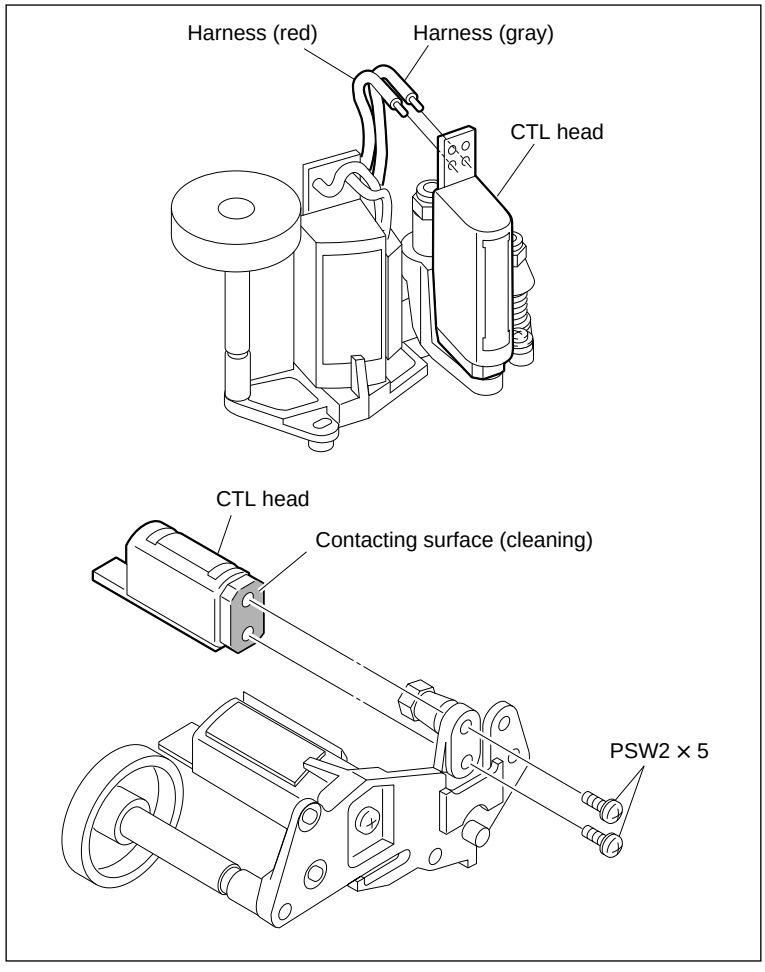
(2) Remove the two screws at the back of the CTL head, and then remove the CTL head.

(3) Clean the contacting surface, and attach a new CTL head with the two screws.

(4) Solder the two wires to the printed circuit board of the CTL head.
(Refer to step (1) of procedure 2.)

Note

Never make a mistake in the color and place of the wire to be soldered. If so, a serious trouble may occur in the compatibility of the tape.

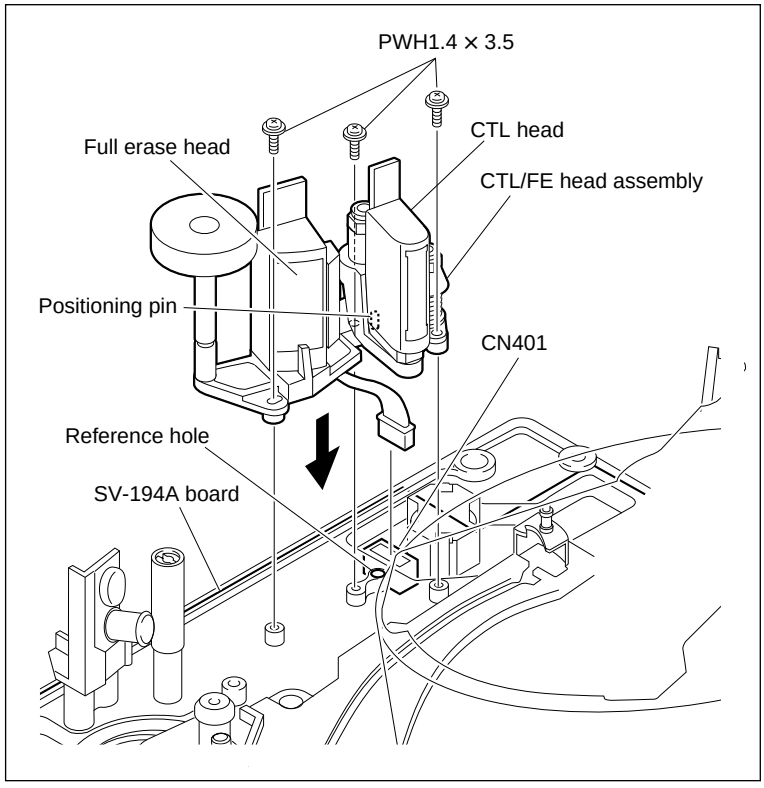


Installation

3. CTL/FE head assembly reinstallation

(1) Align the positioning pin of the CTL/FE head assembly with the reference hole of the mechanical deck, and then fix it with the three screws.
Tightening torque : 9×10^{-2} N•m
{0.9 kgf•cm}

(2) Reconnect the harness connector of the CTL/FE head assembly to the connector CN401 on the SV-194A board.



4. CTL/FE head cleaning

Clean the CTL head, full erase head and tape cleaner with cleaning cloth moistened with cleaning fluid.

Note

After cleaning, wipe with dry cloth.

Adjustment after replacement

5. Tape running check

(Refer to Section 7-4.)

6. Video tracking adjustment

(Refer to Section 7-5.)

7. CTL head height adjustment

(Refer to Section 7-6.)

8. CTL head position adjustment

(Refer to Section 7-7.)

9. AT head position adjustment

(Refer to Section 7-8.)

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6-16. Fan Motors Replacement

WARNING

If the fan motor is out of order, the inside temperature of the unit will rise. Touching the inside in this state may cause a burn. When replacing the fan motor, perform the replacement after powering off until the inside cools off.

6-16-1. Fan Motor (Connector Panel) Replacement

Outline

Replacement

Connector panel opening
Fan motor removal
Fan motor installation
Connector panel reinstallation
Operation check

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)
3. Remove the bottom plate. (Refer to Section 1-4-2.)

Tools

- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver's bit (for M2) : J-6325-380-A

Replacement

1. Connector panel opening

Open the connector panel.
(Refer to Section 1-4-4.)

2. Fan motor removal

(1) Remove the two screws, and then remove the fan bracket.
(2) Disconnect the harness connector of the fan motor from the CN3 on the CP-354 board, and then remove the fan motor.

3. Fan motor installation

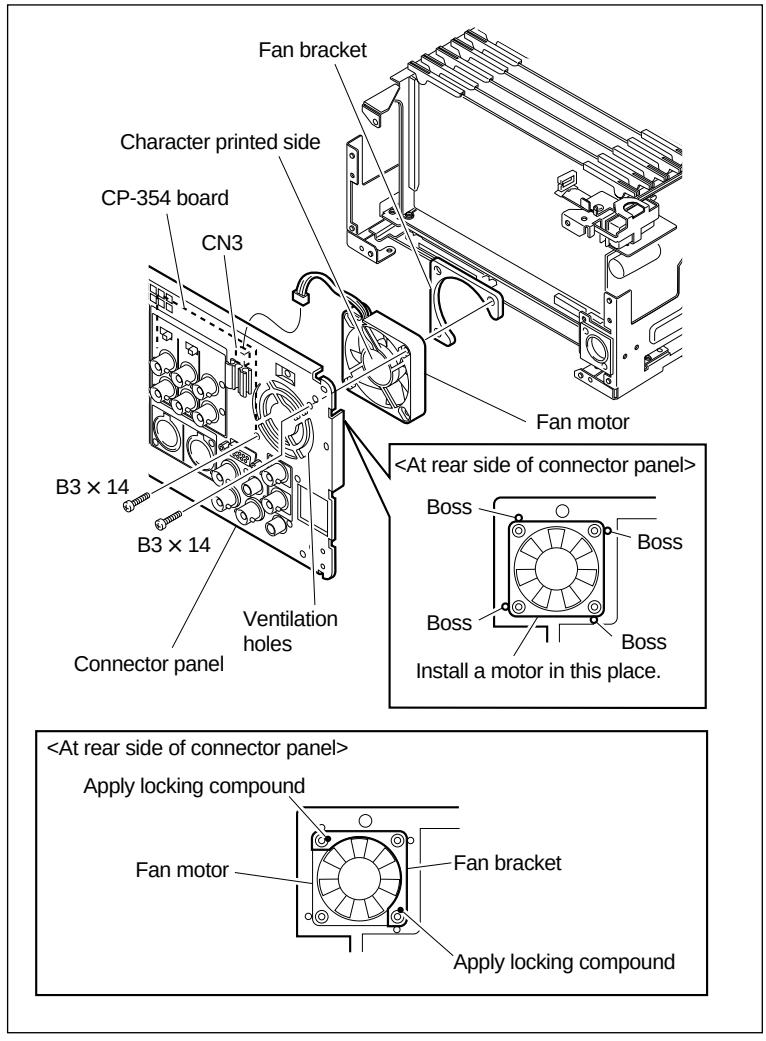
(1) Wipe off dust on the ventilation holes with a soft cloth or equivalent.
(2) Place a new fan motor in the direction shown in the figure on the connector panel so that the outer surfaces of the fan motor contact with the four bosses on the panel.
(3) Fit the motor bracket to the fan motor as shown in the figure, and then tighten them with the two screws.
(4) Apply locking compound to the top of the screws and fan bracket as shown in the figure, after installation.
(5) Connect the harness connector of the fan motor to CN3 on the CP-354 board.

4. Connector panel reinstallation

Reattach the connector panel to the unit.
(Refer to Section 1-4-4.)

5. Operation check

(1) Turn on the power.
(2) Check that the fan motor rotates, and blows off the air from the ventilation hole of the unit.



6-16-2. Fan Motor (right side) Replacement

Outline

Replacement

Fan motor removal
Fan motor installation
Operation check

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)

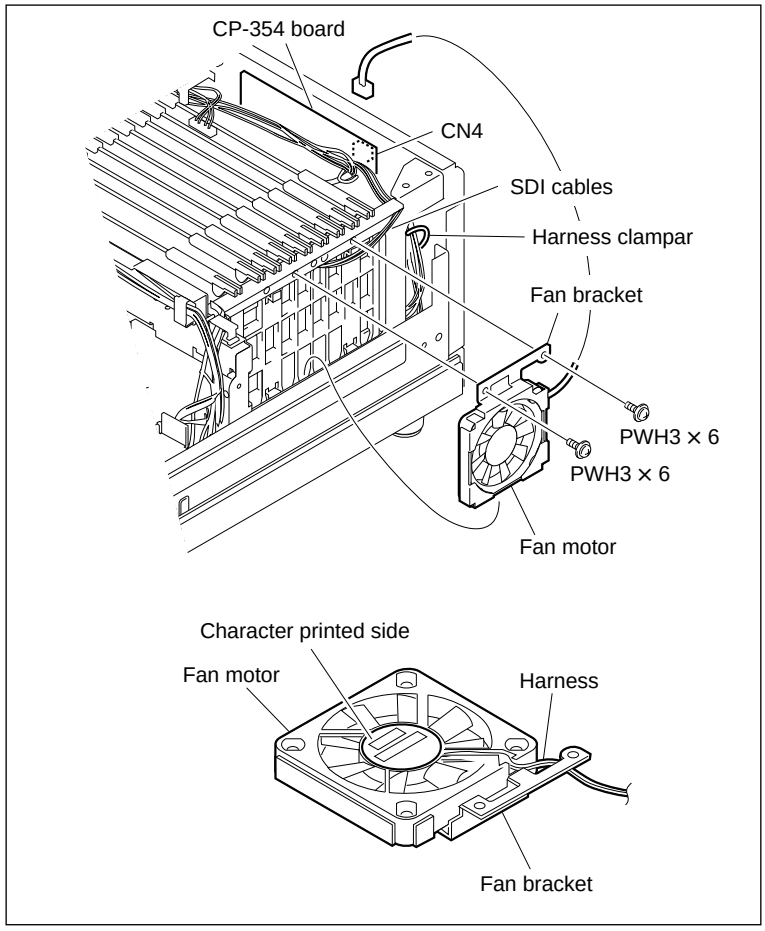
Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (3 kg.cm) : J-6325-400-A

Removal

1. Fan motor removal

(1) Disconnect the harness connector of the fan motor from the connector (CN4) at the top edge of the CP-354 board.
(2) Unfasten the harness clamper, and then extract the fan motor harness.
(3) Remove the two screws at the top of the fan motor, and then remove the fan bracket with fan motor.



2. Fan motor installation

(1) Place a new fan motor in the direction shown in the figure on the fan bracket.

Note

Be sure to install the fan motor so that the character-printed side and harness are placed in a correct position as shown in the figure.

(2) Insert the lower portion of the fan bracket inside of the chassis, and then fasten it with the two screws.

Note

When attaching the fan bracket, be careful not to pinch the three SDI cables between the fan bracket and chassis.

(3) Connect the harness connector of the fan motor to the connector (CN4) on the CP-354 board.
(4) Clamp the SDI cables and fan motor harness with harness clamper as shown in the figure.

3. Operation check

(1) Turn on the power.
(2) Check to see that the fan motor rotates, and draw in the air inside of the unit.

6-17. Board Replacement

6-17-1. SV-194A Board Replacement

Outline

Replacement

DM-114/114P board remobal
Harness connector disconnection
SV-194A board removal
SV-194A board installation
Harness connectors reconnection
DM-114/114P board reinstallation

Adjustment after replacement

Servo system adjustment

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the bottom plate. (Refer to Section 1-4-2.)

Tools

- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver's bit (for M1.4) : J-6325-110-A

Replacement

1. DM-114/114P board removal

Remove the DM-114/114P board.
(Refer to Section 1-6-2.)

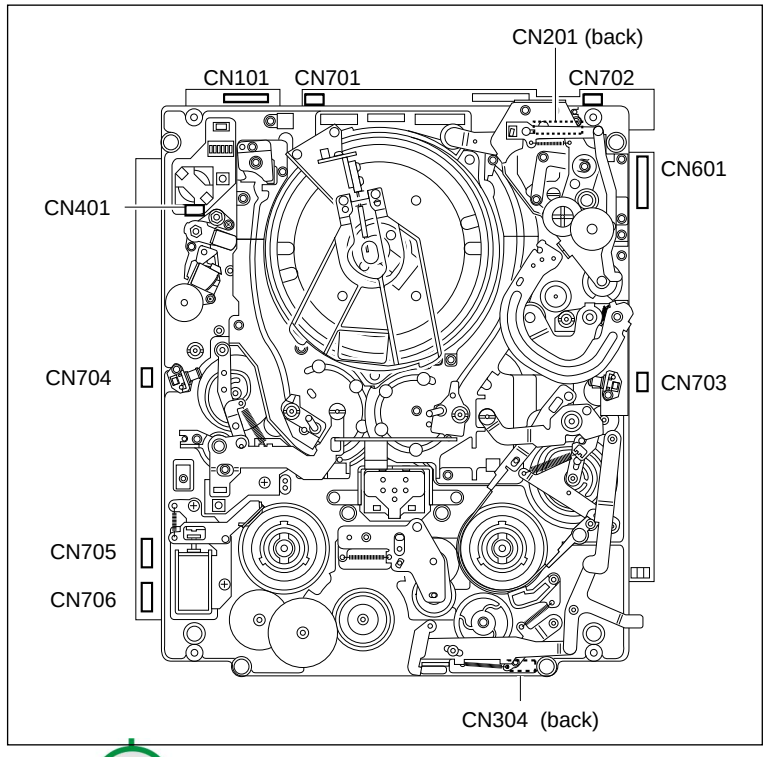
2. Harness connector disconnection

Disconnect the following harness connectors from the SV-194A board.

- CN101 (from drum)
- CN701 (from dew condensation sensor)
- CN702 (from threading motor)
- CN601 (from AT head)
- CN703 (from tape top sensor)
- CN706 (from S brake solenoid)
- CN705 (from tension sensor)
- CN704 (from tape end sensor)
- CN401 (from full erase/CTL head)

At the back of SV-194A board

- CN201 (from capstan motor)
- CN304 (from S reel motor)
- CN301, CN302, CN303, and CN901 (from MB-757A board)



3. SV-194A board removal

Remove the six screws to remove the SV-194A board.

4. SV-194A board installation

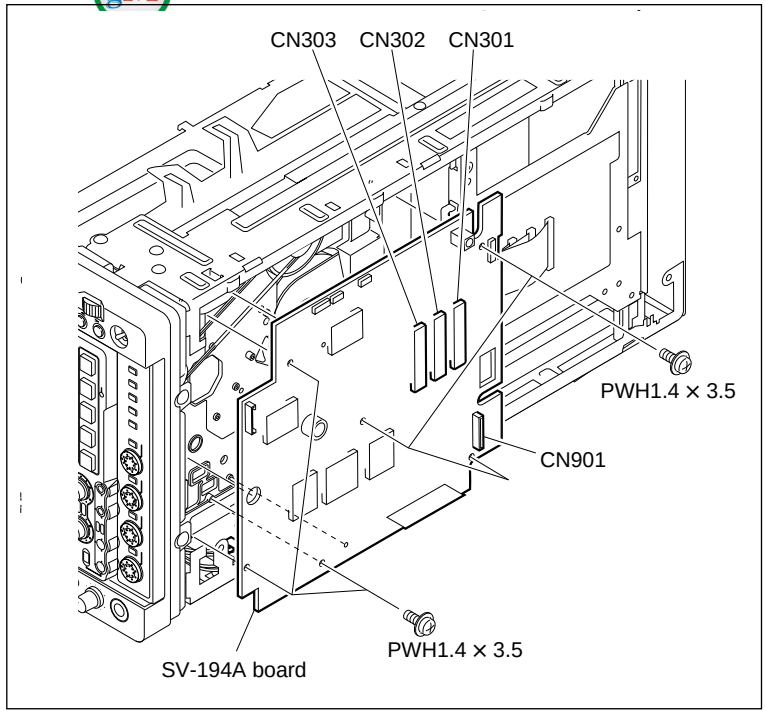
Attach a new SV-194A board in reverse order of procedure 2 and 3.

5. Harness connectors reconnection

Reconnect the harness connectors disconnected in procedure 2 to the DM-114/114P board.

6. DM-114/114P board reinstallation

Reattach the DM-114/114P board .
(Refer to Section 1-6-2.)



Adjustment after replacement

7. Servo system adjustment

(Refer to Sections 3-2-6 and 9-3-1.)

6-17-2. RE-150 Board Replacement

Outline

Replacement

RE-150 board removal
RE-150 board installation

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)

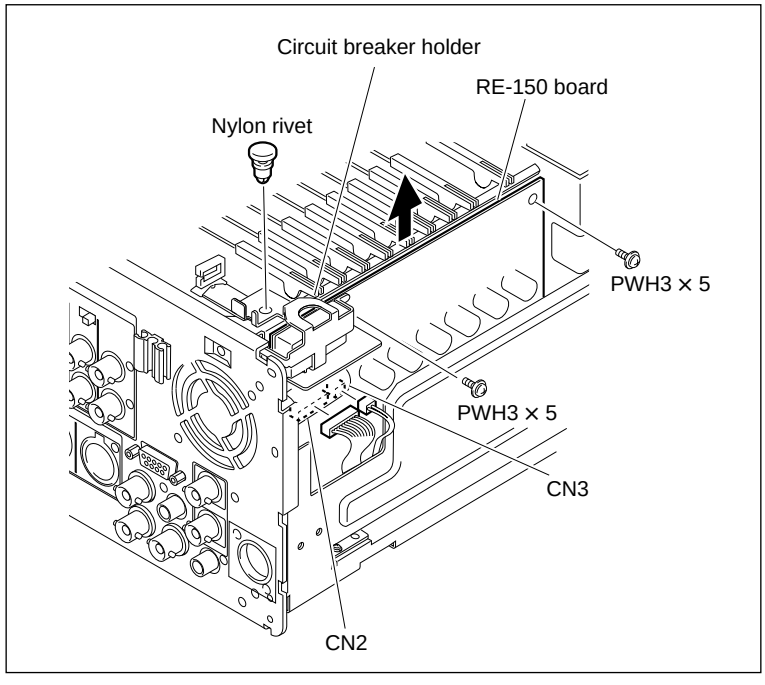
Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A

Replacement

1. RE-150 board removal

(1) Disconnect the harnesses from the two connectors (CN2 and CN3) on the RE-150 board.
(2) Remove the nylon rivet from the circuit breaker holder.
(3) Remove one screw, and then remove the circuit breaker holder from the unit.
(4) Remove one screw at the top right position of the RE-150 board.
(5) Pull up the RE-150 board and disconnect it from the MB-757A board.



2. RE-150 board installation

(1) Slide in a new RE-150 board, and then push it to connect it to the connector on the MB-757A board.
(2) Tighten the screw at the top right position of the RE-150 board.
(3) Assemble the circuit breaker holder, and then tighten it with one screw.
(4) Fasten the circuit breaker holder with the nylon rivet.
(5) Connect the harness connectors to the connectors (CN2 and CN3) on the RE-150 board.

6-17-3. SR-65 Board Replacement

Outline

Replacement

S tension regulator arm assembly removal
SR-65 board replacement
S tension regulator arm assembly reinstallation
Tension regulator guide cleaning

Adjustment after replacement

S tension regulator offset/gain adjustment
Tape running adjustment

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Torque screwdriver's bit (for M2) : J-6325-380-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning fluid : 9-919-573-01

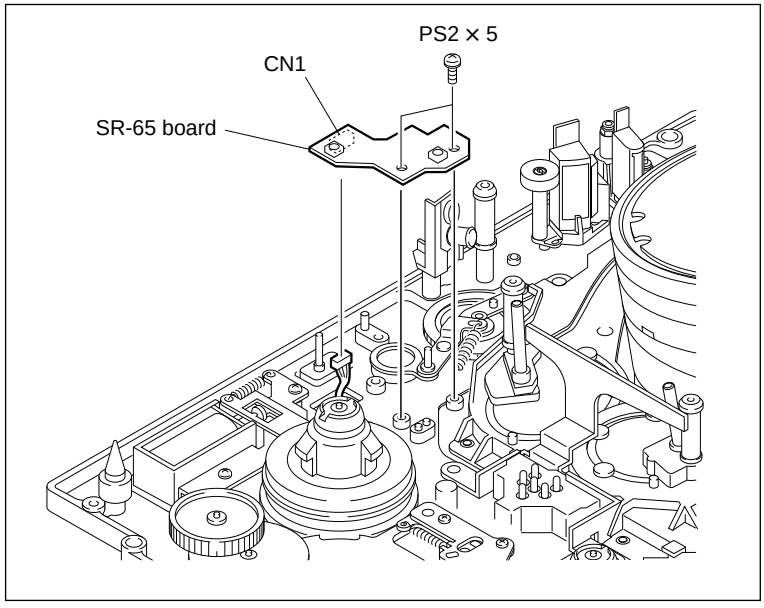
Replacement

1. S tension regulator arm assembly removal

Remove the S tension regulator arm assembly. (Refer to Section 6-9.)

2. SR-65 board replacement

Disconnect the harness from CN1 and remove the two screws, and then replace the SR-65 board with a new one.



3. S tension regulator arm assembly reinstallation

Reattach the S tension regulator arm assembly. (Refer to Section 6-9.)

4. Tension regulator guide cleaning

(1) Clean the guide roller with cleaning cloth moistened with cleaning fluid.
(2) After cleaning, wipe with dry cloth.

Adjustment after replacement

5. S tension regulator offset/gain adjustment

(Refer to Section 7-2.)

6. Tape running adjustment

(Refer to Section 7-4.)

6-17-4. DC-97 Board (DC IN connector) Replacement

Outline

Replacement

DC-97 board removal
DC-97 board installation

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)

Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver's (3 kg•cm) : J-6325-400-A

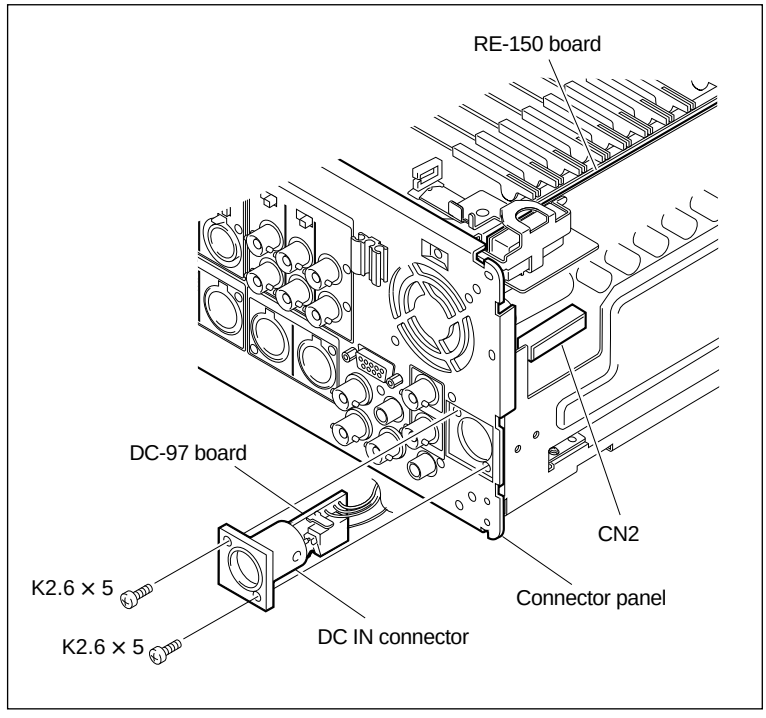
Replacement

1. DC-97 board removal

(1) Disconnect the harness connector from the connector (CN2) on the RE-150 board.
(2) Remove the two screws, and remove the DC IN connector with DC-97 board from the unit.

2. DC-97 board installation

(1) Put a new DC IN connector with the DC-97 board into the round hole of the connector panel with the board placed on its left side, and fasten it with the two screws removed in procedure 1.
(2) Connect the harness connector from the DC IN connector to the connector (CN2) on the RE-150 board.



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6-17-5. HP-100 Board Replacement

Outline

Replacement

Front panel removal
Control knob removal
HP-100 board replacement
Front panel reinstallation
Control knob reinstallation

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)
3. Remove the bottom plate. (Refer to Section 1-4-2.)

Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A

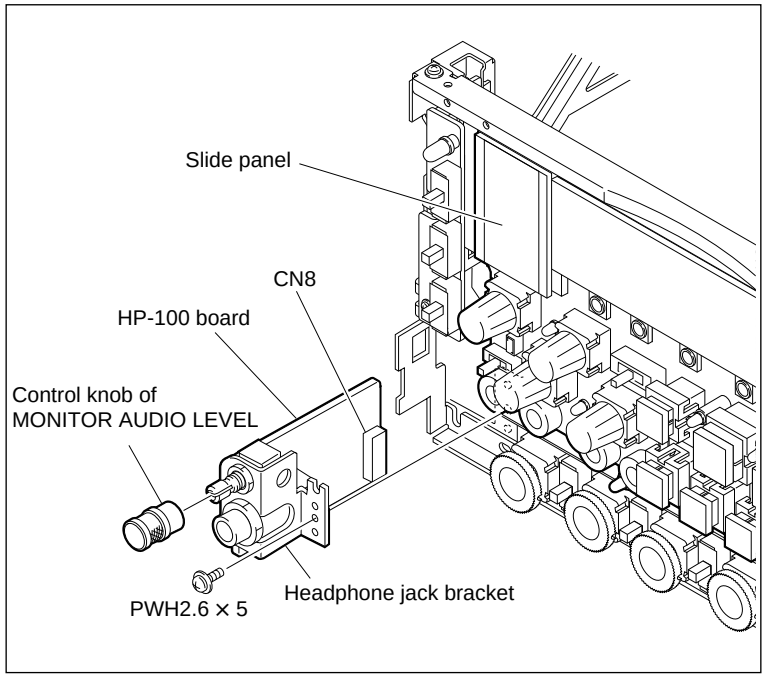
Replacement

1. Front panel removal

Remove the front panel. (Refer to Section 1-4-3.)

2. Control knob removal

Remove the control knob of the MONITOR AUDIO LEVEL.



3. HP-100 board replacement

(1) Move the slide panel to upward.
(2) Open the DM-114/114P board.
(Refer to Section 1-6-2.)
(3) Disconnect the connector (CN8) on the HP-100 board.
(4) Remove one screw of the headphone jack bracket at the front side of the unit, and then remove the HP-100 board from the unit.
(5) Replace the HP-100 board with a new one.
(6) Tighten the headphone jack bracket with one screw.
(7) Connect the harness connector to the connector (CN8) on the HP-100 board.
(8) Reattach the DM-114/114P board.
(Refer to Section 1-6-2.)

4. Front panel reinstallation

Reattach the front panel. (Refer to Section 1-4-3.)

5. Control knob reinstallation

Reattach the control knob of the MONITOR AUDIO LEVEL.

Note

When turning the control knob fully clockwise and counterclockwise, check that the white line on the control knob is positioned symmetrical.

6-17-6. SE-529 Board Replacement

Outline

Replacement

SE-529 board replacement

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)

Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A

Replacement

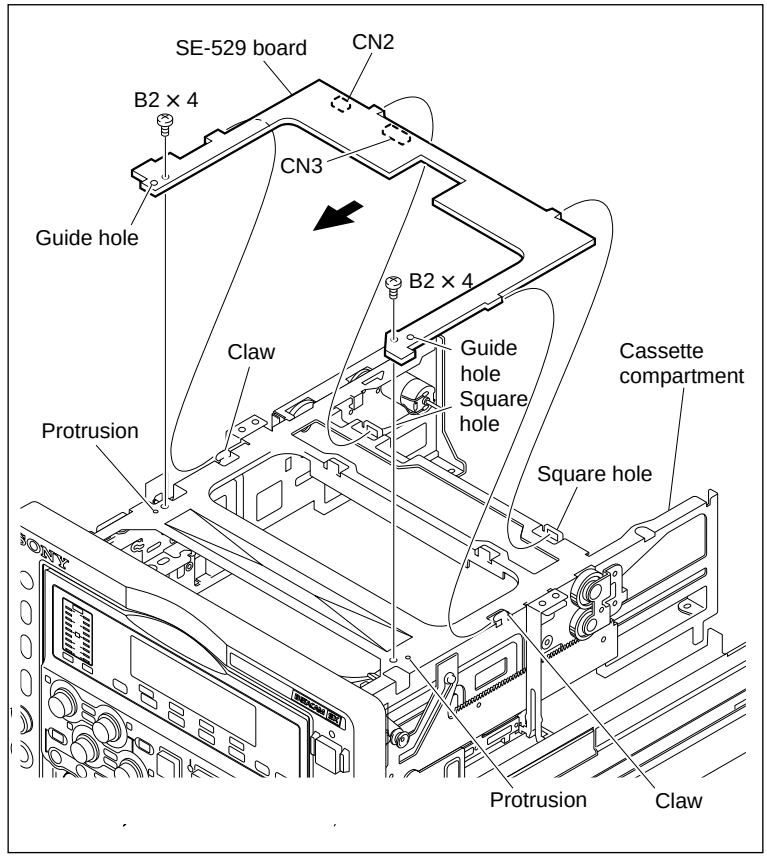
1. SE-529 board replacement

(1) Disconnect the harness connectors from the connector (CN3) on the SE-529 board.
(2) Remove the two screws and move the SE-529 board in the direction of the arrow, and then disconnect the harness from the connector (CN2) to remove the SE-529 board.
(3) Attach a new SE-529 board to the cassette compartment.

Note

- Ensure that the protrusions of the cassette compartment chassis are surely inserted into the guide holes near the fixing screws on the SE-529 board.
- Ensure that the SE-529 board is surely installed into the two claws and square holes on the cassette compartment chassis.

(4) Attach the SE-529 board with the two screws.
(5) Connect the harness connectors to the connectors (CN2 and CN3) on the SE-529 board.



6-18. Board Replacement Inside the Front Panel Assembly

6-18-1. VFD Assembly Replacement

Outline

Replacement

Slide panel removal
Control knob removal
VFD assembly replacement
Slide switch knob reinstallation
Control knob reinstallation
Slide panel reinstallation

Precaution

If the VFD assembly is replaced, the stored setting data of the sub menu and the lastly pressed button data are lost.
After replacement, when turning on the power once, these data are initialized to the factory setting data automatically. If necessary, reset the sub menu.
(Refer to the Operation Manual.)

Preparation

1. Turn off the power.

Tools

- Torque screwdriver’s bit (for M2) : J-6325-380-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A

Replacement

1. Slide panel removal

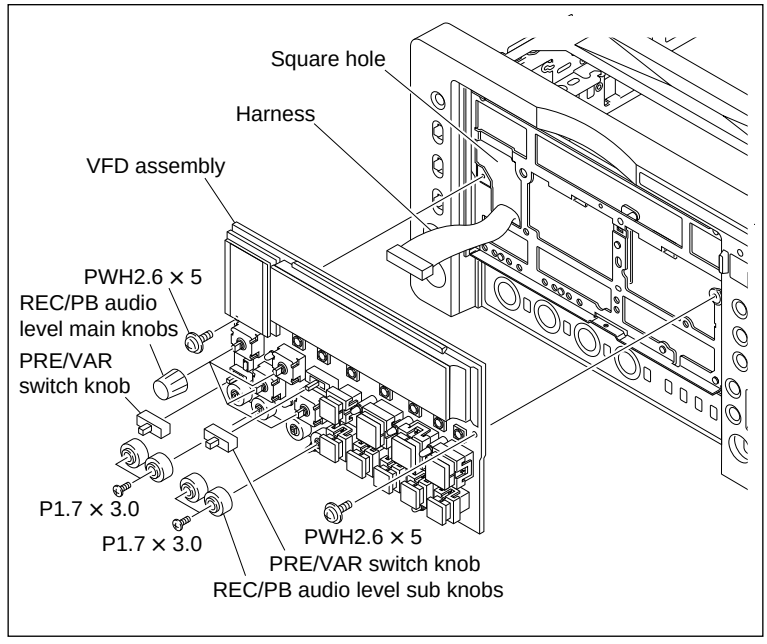
Remove the slide panel. (Refer to Section 1-4-3.)

2. Control knob removal

(1) Remove the four control knobs of the REC/PB AUDIO LEVEL main.
(2) Remove the two slide switch knobs of the PRE/VAR switch.
(3) Remove the four control knobs of the REC/PB AUDIO LEVEL sub.

3. VFD assembly replacement

(1) Remove the two screws to remove the VFD assembly.
(2) Open the coating lead pins at the back side of the VFD assembly, and unfasten the harness.
(3) Disconnect the harness connector from the connector (CN1).
(4) Connect the harness connector to a new VFD assembly, and hold the harness with coating lead pins.
(5) Move the slide chassis downward.
(6) Pass the harness connected to the VFD assembly through the square hole of the slide chassis as shown in the figure, and attach the VFD assembly to the slide chassis with the two screws.



4. Slide switch knob reinstallation

Reattach the two PRE/VAR slide switch knobs removed in step 2 with the yellow tab is positioned to the left to the switch on the new VFD assembly.

5. Control knob reinstallation

Reattach the four each knobs of the REC/PB AUDIO LEVEL main and REC/PB AUDIO LEVEL sub to the VFD assembly.

6. Slide panel reinstallation

Reattach the slide panel to the chassis.
(Refer to Section 1-4-3.)

6-18-2. SW-21 Board Replacement

Outline

Replacement

Front panel removal
VFD assembly removal
SW-21 board replacement
VFD assembly reinstallation
Front panel reinstallation

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)
3. Remove the bottom plate. (Refer to Section 1-4-2.)

Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A

Replacement

1. Front panel removal

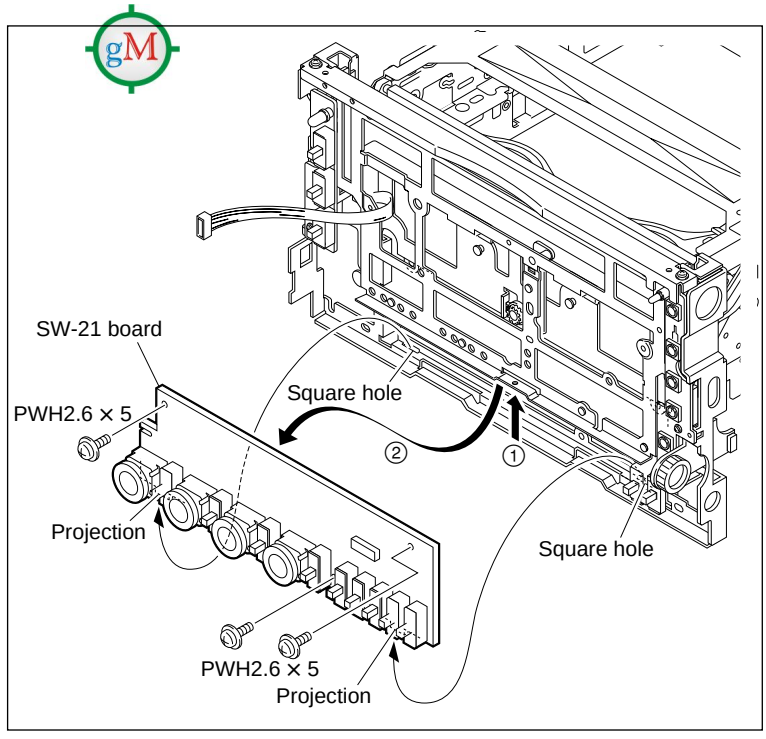
Remove the front panel. (Refer to Section 1-4-3.)

2. VFD assembly removal

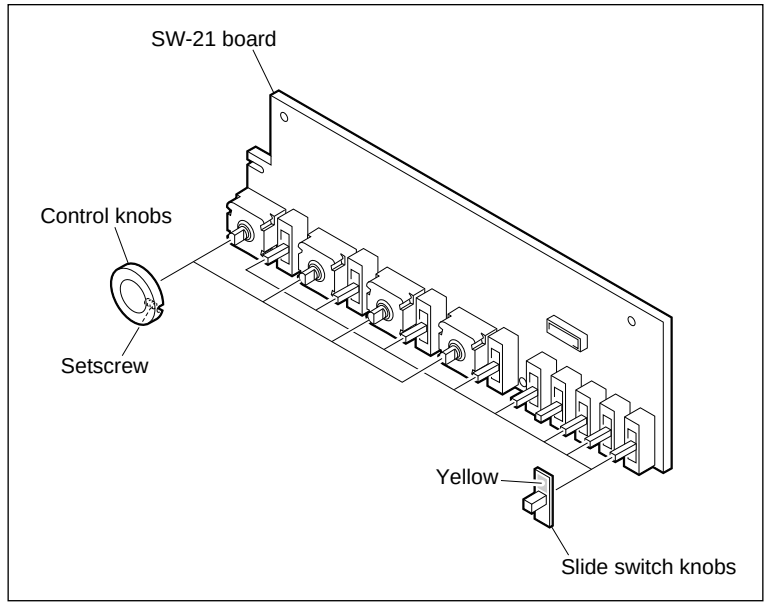
Remove the VFD assembly.
(Refer to Section 6-18-1.)

3. SW-21 board replacement

(1) Open the DM-114/114P board. (Refer to Section 1-6-2.)
(2) Open the four coating lead pins at the back-side of the SW-21 board, and unfasten the harness.
(3) Disconnect the five connectors (CN3 through CN6 and CN100) connected to the SW-21 board.
(4) Remove the three screws from the front side of the unit. Move the SW-21 board in the direction of the arrows ①and ② to remove it.



(5) Remove the four control knobs after loosening the setscrew using hexagon wrench, and remove the nine slide switch knobs from the removed board.
(6) Attach the nine slide switch knobs with the yellow tub is positioned to upward, and the four control knobs using hexagon wrench to the new SW-21 board.
(7) Insert the two projections at the lower side of the board into the square holes of the chassis, and insert the bosses of the chassis into the holes on both sides of the board, and then fasten it with the two screws.
(8) Connect the five harness connectors to the SW-21 board.
(9) Clamp the harness with the four coating lead pins.
(10) Reattach the DM-114/114P board. (Refer to Section 1-6-2.)



4. VFD assembly reinstallation

Reattach the VFD assembly.
(Refer to Section 6-18-1.)

5. Front panel reinstallation

Reattach the front panel. (Refer to Section 1-4-3.)

6-18-3. SW-22 Board Replacement

Outline

Replacement

Front panel removal
SW-22 board replacement
Front panel reinstallation

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)
3. Remove the bottom plate. (Refer to Section 1-4-2.)

Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A

Replacement

1. Front panel removal

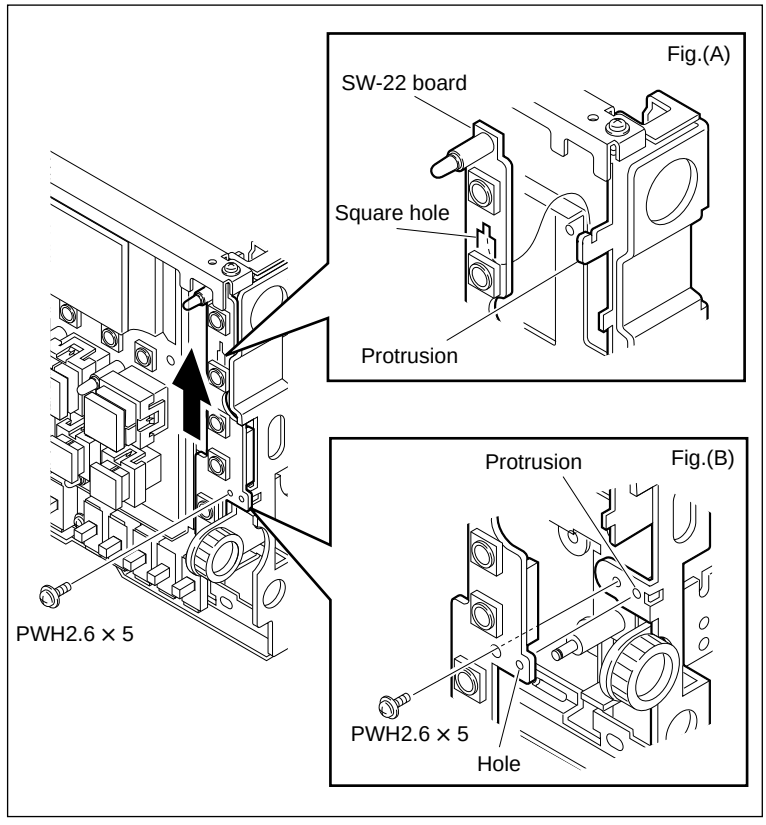
Remove the front panel. (Refer to Section 1-4-3.)

2. SW-22 board replacement

(1) After removing one screw, move the SW-22 board in the direction of the arrow to release the lock at the square hole portion as shown in the Fig. (A).
(2) Disconnect the harness connector from the SW-22 board, and remove the SW-22 board from the unit.
(3) Connect the harness connector to a new SW-22 board.
(4) Install the protrusion of the chassis into the square hole of the SW-22 board, and move the SW-22 board in the opposite direction of the arrow to lock as shown in the Fig. (A).
(5) Secure the SW-22 board with one screw.

Note

Make sure that the protrusion of the chassis is surely inserted into the hole of the board. (See Fig. (B).)



3. Front panel reinstallation

Reattach the front panel. (Refer to Section 1-4-3.)

6-18-4. SW-23 Board Replacement

Outline

Replacement

Front panel removal
SW-23 board replacement
Front panel reinstallation

Preparations

1. Turn off the power
2. Remove the top plate. (Refer to Section 1-4-1.)
3. Remove the bottom plate. (Refer to Section 1-4-2.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M2): J-6325-380-A

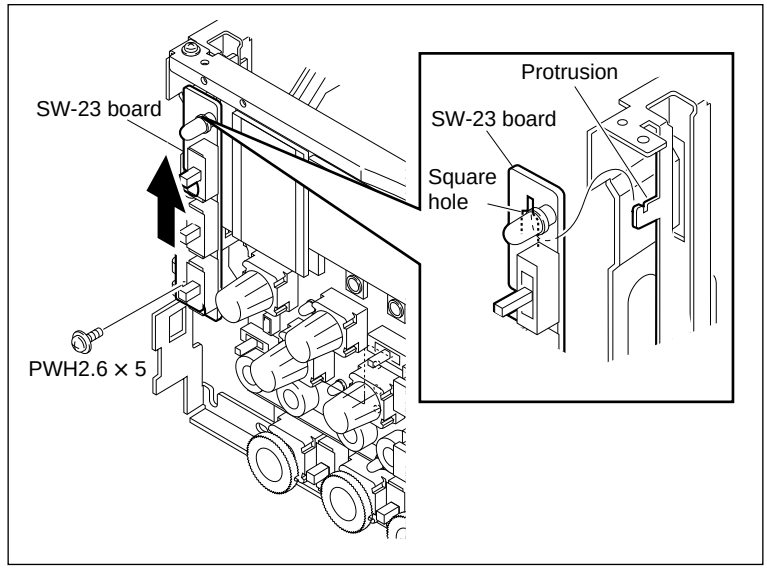
Replacement

1. Front panel removal

Remove the front panel. (Refer to Section 1-4-3.)

2. SW-23 board replacement

(1) After removing one screw, move the SW-23 board in the direction of the arrow to release the lock at the square hole portion.
(2) Disconnect the harness connector from the SW-23 board, and then remove the SW-23 board from the unit.
(3) Remove the three slide switch knobs from the removed SW-23 board.
(4) Connect the harness connector to a new SW-22 board.
(5) Install the protrusion of the chassis into the square hole of the SW-23 board, and move the SW-23 board in the opposite direction of the arrow to lock.
(6) Secure the SW-23 board with one screw.
(7) Reattach the three slide switch knobs removed in step (3) with the yellow tab is positioned to upward to the switch on the SW-23 board.



3. Front panel reinstallation

Reattach the front panel. (Refer to Section 1-4-3.)

6-18-5. CT-209 Board (JOG dial) Replacement

Outline

Replacement

Front panel removal
CT-209 board replacement
Front panel reinstallation

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)
3. Remove the bottom plate. (Refer to Section 1-4-2.)

Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A

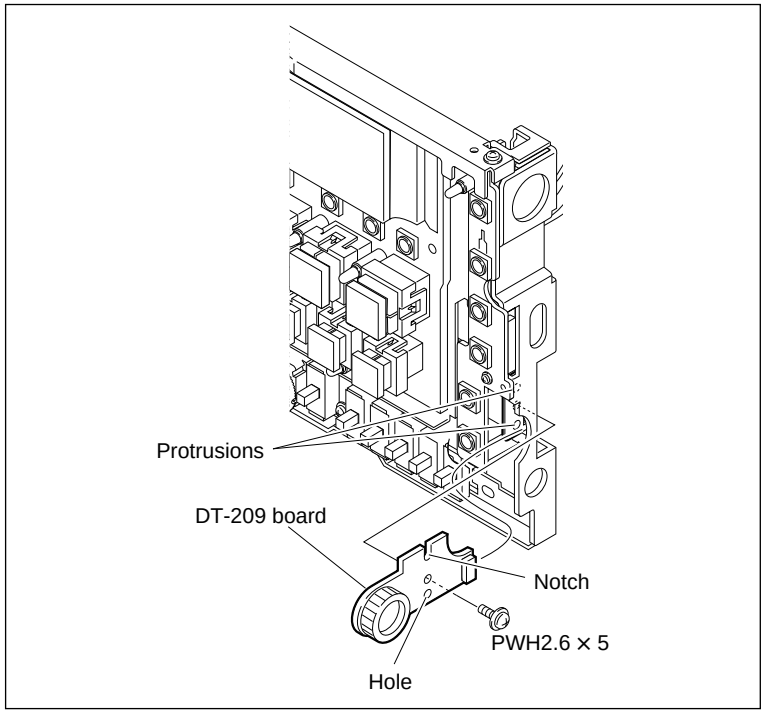
Replacement

1. Front panel removal

Remove the front panel. (Refer to Section 1-4-3.)

2. CT-209 board replacement

(1) Open the DM-114/114P board. (Refer to Section 1-6-2.)
(2) Disconnect the harness connector from the connector on the CT-209 board.
(3) Remove one screw to remove the CT-209 board from the unit.
(4) Attach a new CT-209 board so that the two protrusions of the bracket are inserted into the hole and notch of the board, and fix it with one screw.
(5) Connect the harness connector to the connector on the CT-209 board.
(6) Reattach the DM-114/114P board. (Refer to Section 1-6-2.)



3. Front panel reinstallation

Reattach the front panel. (Refer to Section 1-4-3.)

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6-18-6. PSW-72 Board Replacement

Outline

Replacement

Front panel removal
PSW-72 board replacement
Front panel reinstallation

Preparations

1. Turn off the power.
2. Remove the top plate. (Refer to Section 1-4-1.)
3. Remove the bottom plate. (Refer to Section 1-4-2.)

Tools

- Torque screwdriver's bit (for M2) : J-6325-380-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A

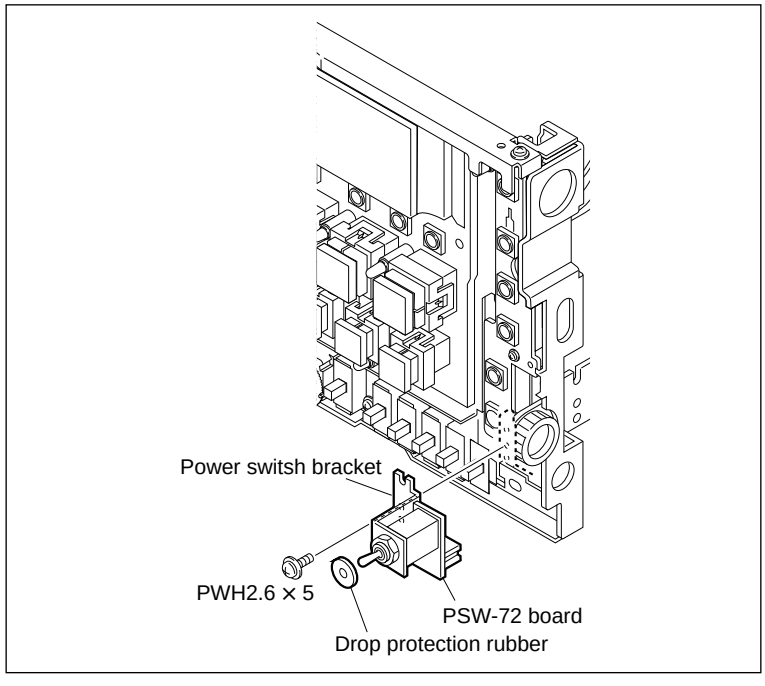
Replacement

1. Front panel removal

Remove the front panel. (Refer to Section 1-4-3.)

2. PSW-72 board replacement

(1) Remove one screw, and then remove the power switch bracket with the PSW-72 board from the unit.
(2) Remove the drop protection rubber from the power switch bracket.
(3) Disconnect the harness connector from the connector on the PSW-72 board.
(4) Connect the harness connector to the connector on the PSW-72 board.
(5) Attach the drop protection rubber to the switch, and secure a new power switch bracket with the PSW-72 board with one screw.



3. Front panel reinstallation

Reattach the front panel. (Refer to Section 1-4-3.)

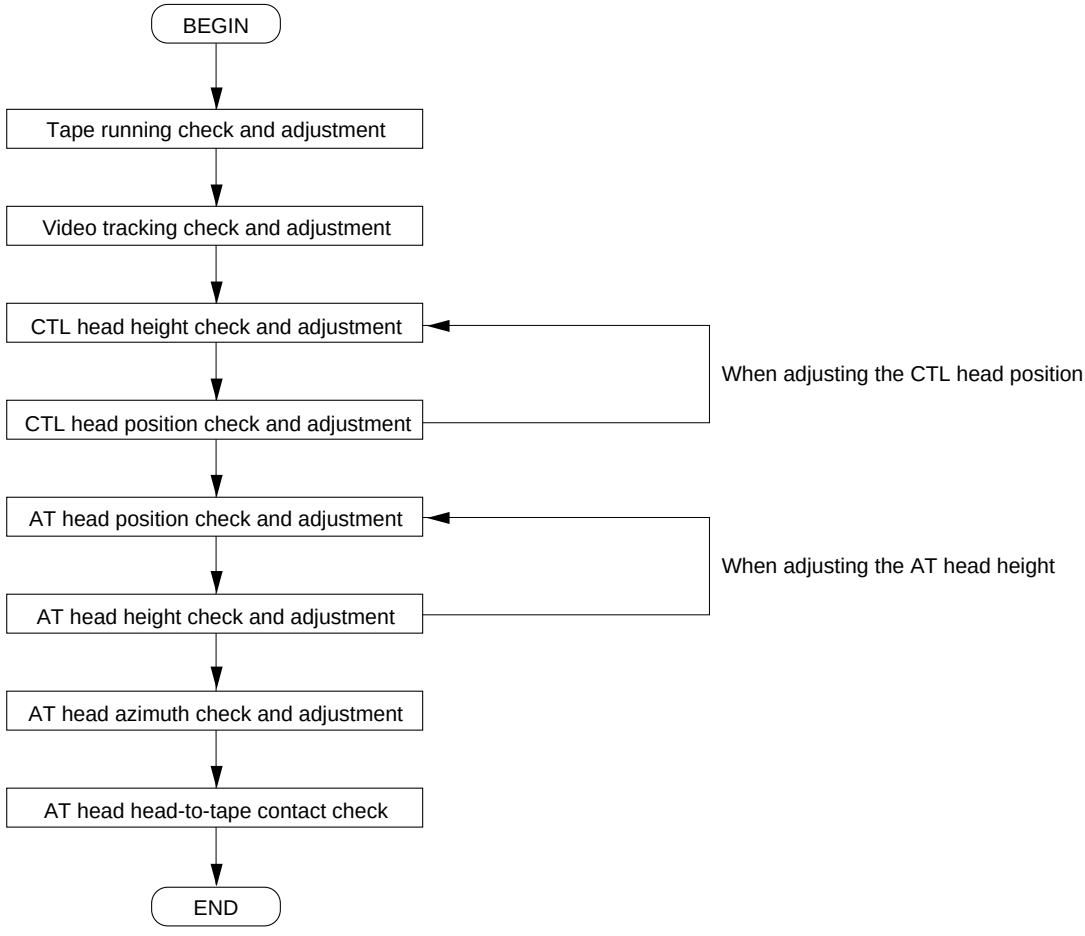
Section 7
Tape Path Alignment

7-1. General Information for Tape Path Adjustment

This section describes the fundamental knowledge such as preparation and prior knowledge to perform the tape path system check and adjustment.

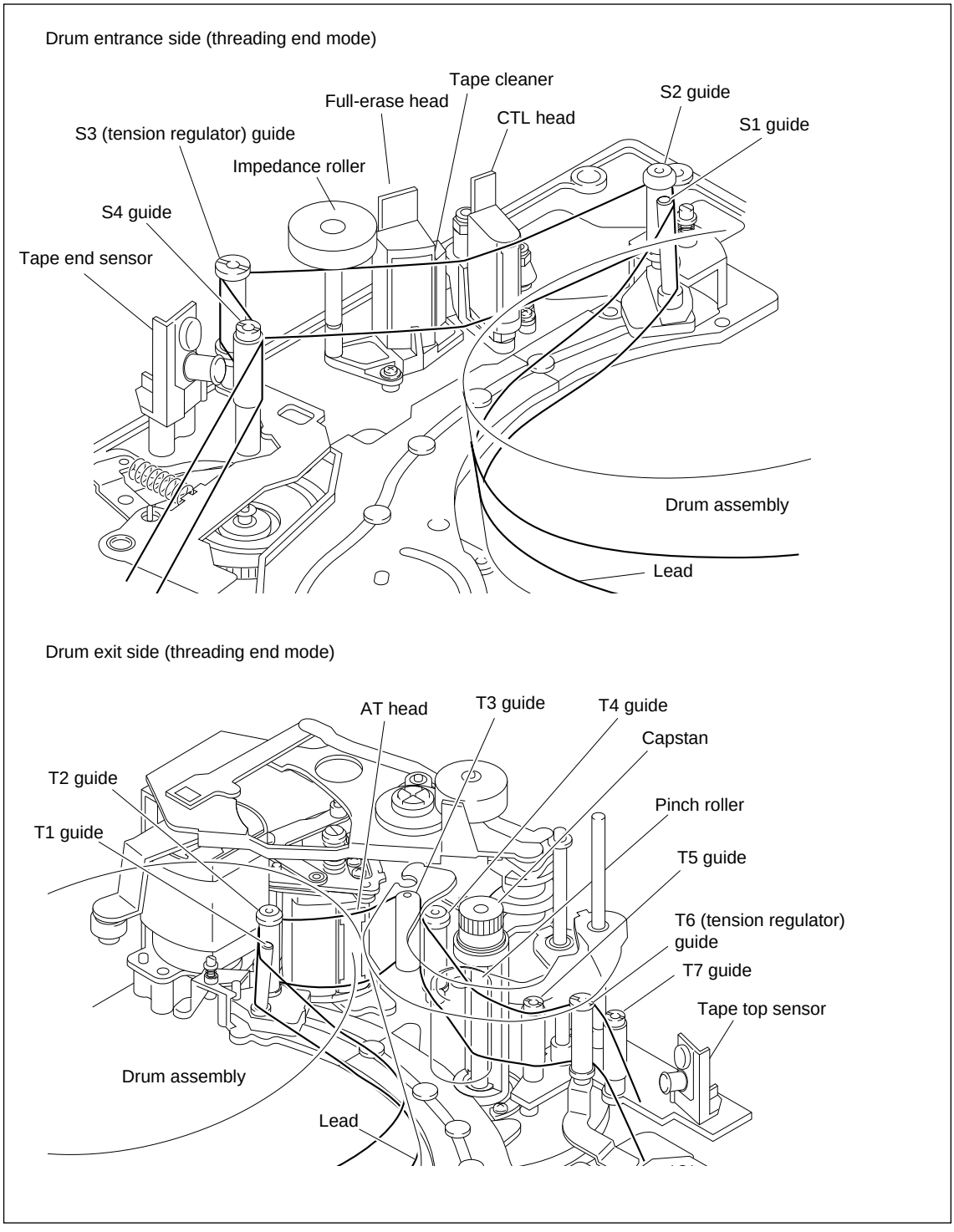
7-1-1. Alignment Flow Chart

The checks and adjustments described in Section 7-4 through Section 7-11 are closely related to each other.
Perform the checks and adjustments referring to the following flow chart.


BEGIN
Tape running check and adjustment
Video tracking check and adjustment
CTL head height check and adjustment
CTL head position check and adjustment
When adjusting the CTL head position
AT head position check and adjustment
AT head height check and adjustment
When adjusting the AT head height
AT head azimuth check and adjustment
AT head head-to-tape contact check
END

7-1-2. Parts Location of the Tape Running System

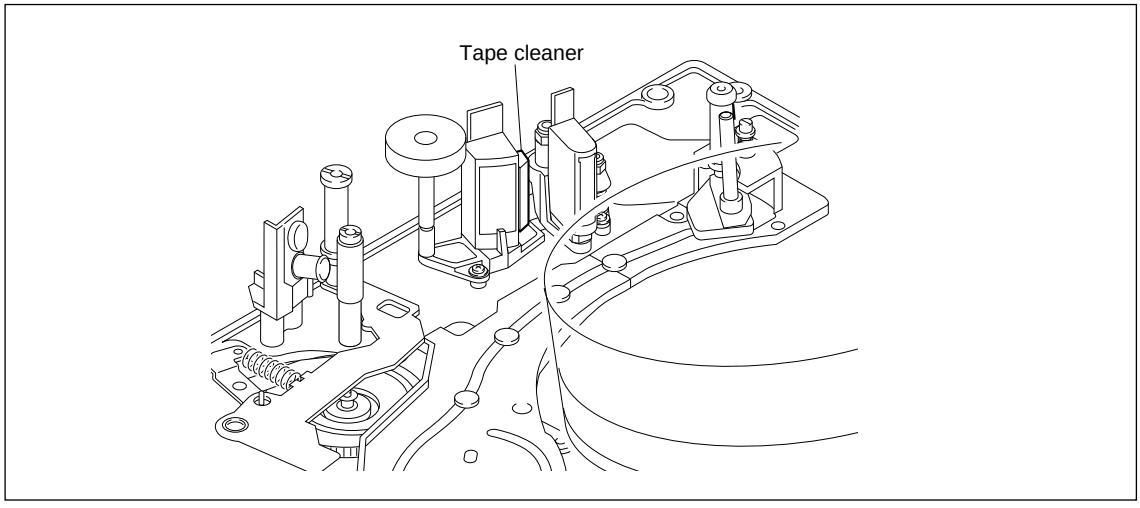
Following figure describes the names of each component part of the tape running system.



7-1-3. Tape cleaner

CAUTION

Never cantact the tape cleaner placed between full erase head and CTL head with bare hand.
It is danger of cutting your finger because the tape cleaner has a sharp edge.
Pay careful attention when adjusting the CTL head and so on.



7-1-4. Tools and other equipment

Tools

- Tape guide adjustment driver (45) : J-6322-420-A
- HN-257 mounted circuit board : A-8317-304-A
- Inspection mirror : J-6080-840-A
- Torque cassette (FWD back ten.) (MW-389) : J-6323-890-A
- Parallel pin (d = 2.0 mm) : 3-703-358-04
- Torque screwdriver's bit (for M1.4) : J-6325-110-A
- Nutdriver (s = 4.5 mm) : 7-700-751-01
- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid : 9-919-573-01
- Screw locking compound : 7-432-114-11
- Alignment tape, SR2-1 (for 525/60 system) : 8-960-075-11
- Alignment tape, SR2-1P (for 625/50 system) : 8-960-075-61
- Alignment tape, CR8-1A (for analog Betacam, NTSC) : 8-960-097-45
- Alignment tape, CR8-1A PS (for analog Betacam, PAL) : 8-960-098-45

Note

Refer to Section 1-18 about the contents of the alignment tapes.

Other Equipment

- Betacam SX tape, BCT-62SXA (Commercially available)
- Oscilloscope (Tektronix 2465B or equivalent)
- DC power supply (AC-550/550CE or equivalent)
  (The AC adaptors AC-500 and AC-DN1 cannot be used to derive power.)
- Weight about 1000 g (It is smaller than S type cassette tape in size.)
- Wooden skewer

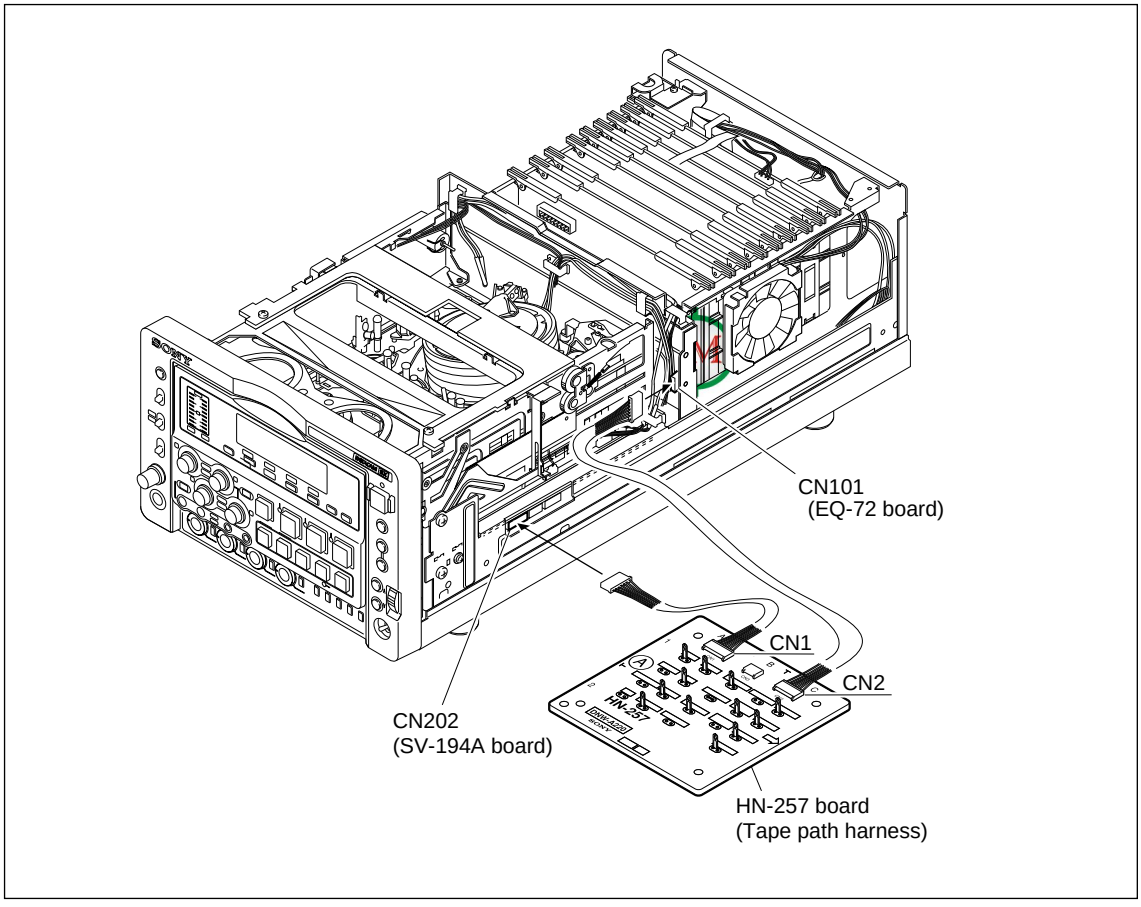
7-1-5. HN-257 Board (Tape Path Harness) Connection

Notes

- Do not place this HN-257 board on a metal workbench directly. If not, incorrect waveform may appear.
- After removing the bottom plate, place the unit horizontally on a flat workbench.

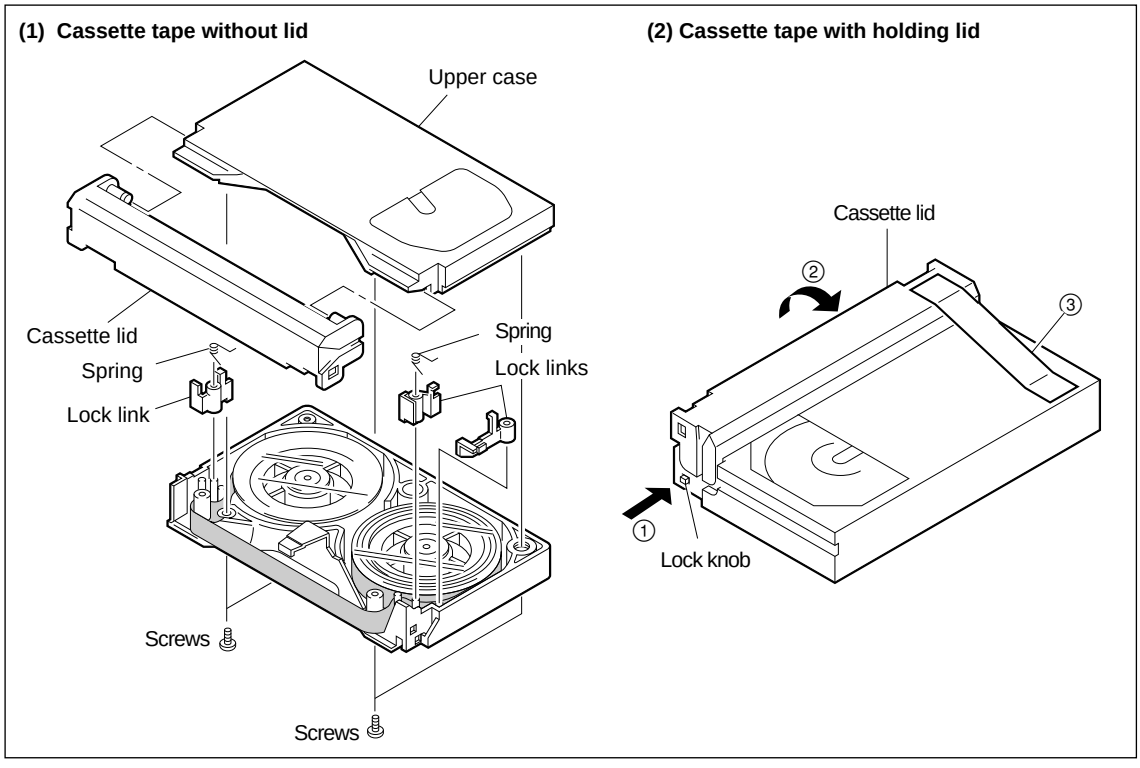
How to connect the tape path harness to the HN-257 board

1. Turn off the power.
2. Remove the top plate. (Refer to the Section 1-4-1.)
3. Connect the harness connector connected to CN1 on the HN-257 board to CN202 on the SV-194A board.
4. Connect the harness connector connected to CN2 on the HN-257 board to CN101 on the EQ-72 board.



7-1-6. Cassette Tape for the Tape Path Adjustment

The tape path adjustment should be performed under the state that the cassette compartment is removed. Therefore, it is necessary to make a following modification (1) or (2) to the cassette tape and alignment tape that are used for the tape path adjustment.



(1) Cassette tape without lid
Disassemble the cassette tape, and take off the cassette lid, springs and lock links shown in the figure.

(2) Cassette tape with holding lid
Open the cassette lid (②) while pushing the lock knob (①), and fix the cassette lid using an adhesive tape (③).

When putting the cassette tape or alignment tape on the VTR, put it on the cassette posts on the mechanical deck. And then, put a weight on the cassette tape so that it does not rise up. The weight abut 1000 g is suitable.

7-1-7. Cleaning

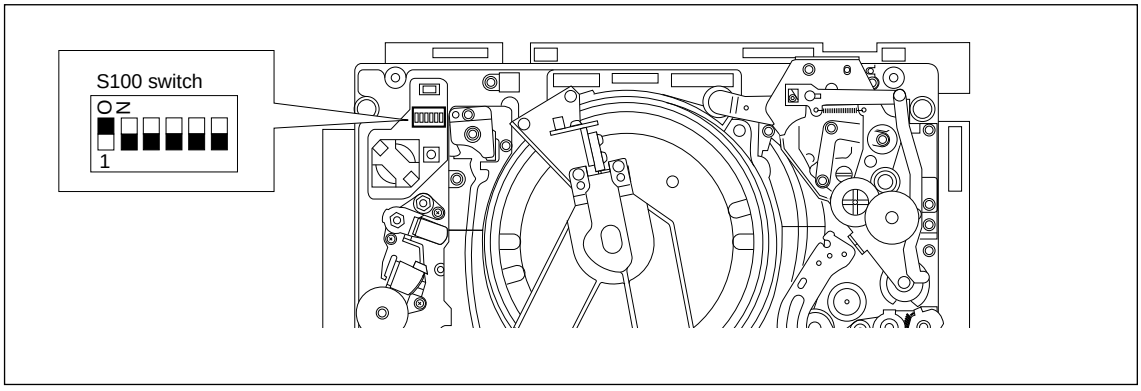
Clean the following tape running surfaces before performing the tape path adjustment.

- Tape running surface of the upper drum and video heads
- Tape running surfaces of the lower drum and lead
- Stationary heads and tape cleaner
- Tape guides

How to clean these portions, refer to the Section 4.

7-1-8. Cassette Compartment

The tape path adjustment should be performed with the cassette compartment is removed.
It should be set the switch S100-1 on the SV-194A board to ON so that the unit put into the cassette compartment locked state electrically. (For detail, refer to Section 5-1-3. Entering the threading end state with the cassette compartment removed.)
After adjustment is completed, be sure to set this switch back to the original position (OFF).



7-1-9. Tracking Control

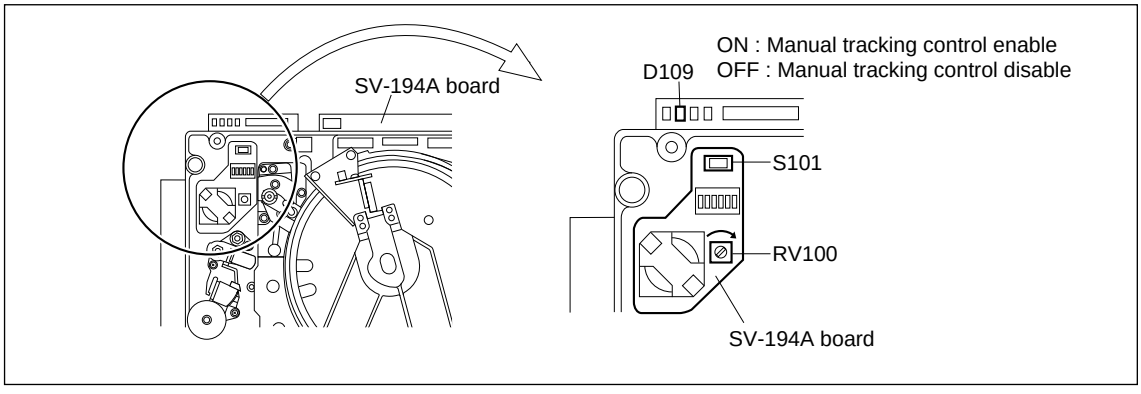
The auto tracking function operates under the normal operation. During the video tracking adjustment, this auto tracking function should be set to off.
In this state, the tracking control operation using the tracking VR is available.

How to enable the tracking control

1. Turn on the power.
2. Play back the cassette tape or alignment tape.
3. Press and hold the switch S101 on the SV-194A about three seconds until the yellow indicator D109 lights up. Then the tracking can be controlled manually with RV100 on the SV-194A board.

Above state (manual tracking) will be released by means of the following operations, the unit will return to the automatic tracking state (Tracking cannot be controlled manually.), and the indicator D109 will go off.

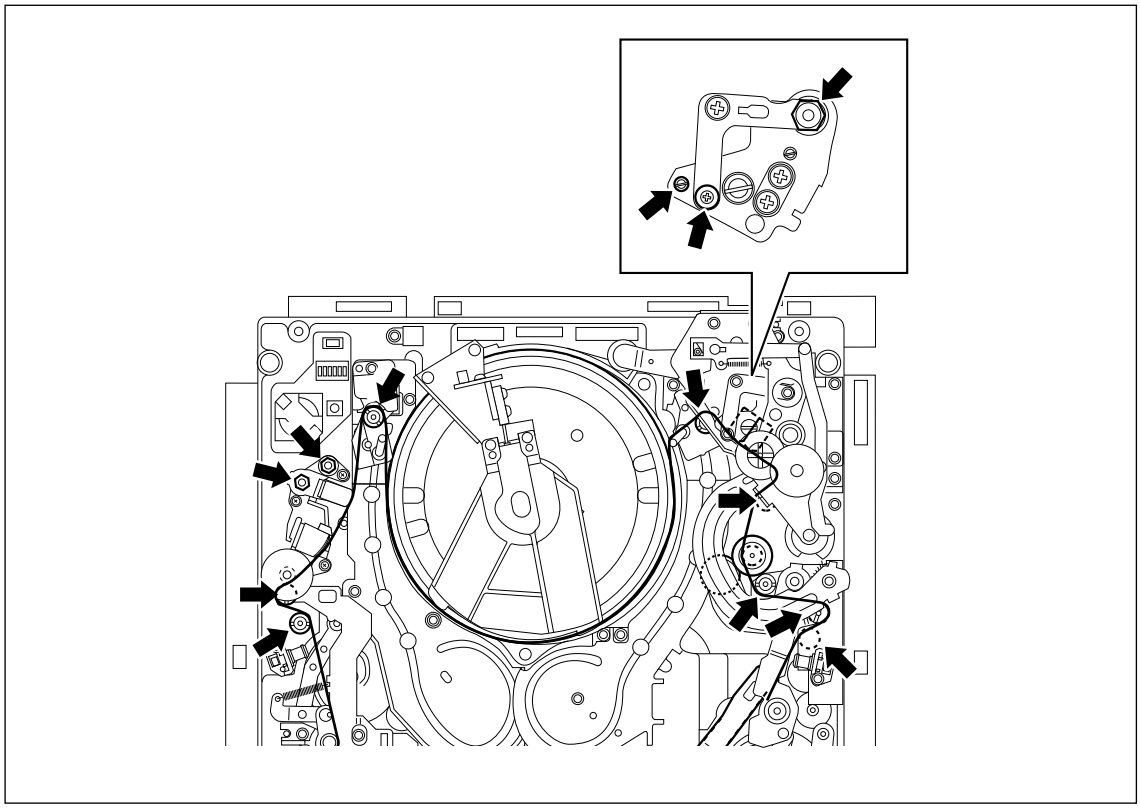
- Press and hold the switch S101 about three seconds again.
- Press EJECT button.
- Turn off the power.



7-1-10. Locking Compound

When loosening or tightening the screws shown in the figure, apply locking compound to the screws after adjustment is completed.
The locking compound that applied to other surrounding parts must be wiped off with gauze or soft cloth.

• Locking compound : 7-432-114-11



7-2. S Tension Regulator Offset/Gain Adjustment

Precaution

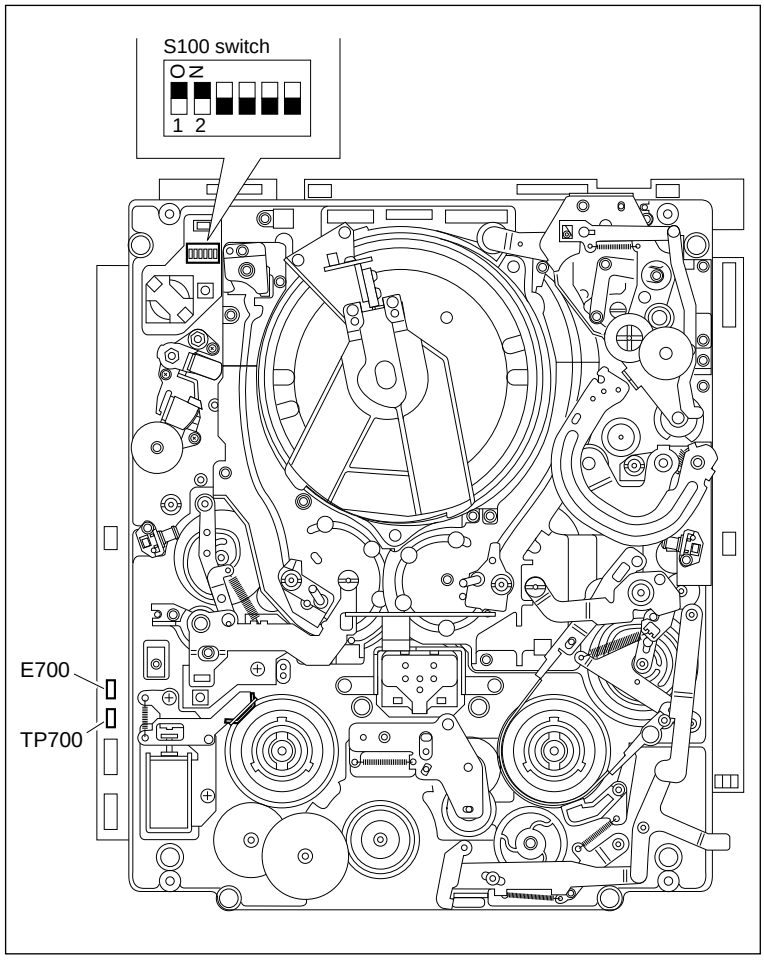
Be sure to perform this adjustment after replacing the S main brake shoe, S reel motor, S reel table and so on.

Tools

- Parallel pin (d = 2.0 mm) : 3-703-358-04
- Oscilloscope (Tektronix 2465B or equivalent)

Preparations

1. Turn off the power.
2. Remove the top plate.
   (Refer to Section 1-4-1.)
3. Remove the cassette compartment.
   (Refer to Section 1-5.)
4. Connect the oscilloscope as follows (See figure on the right side.):
   CH-1 : TP700/SV-194A
   GND : E700/SV-194A
   CH-1 : DC mode, 0.2 V/DIV
5. Set the switches S100-1 and S100-2 on the SV-194A board to ON.
6. Turn on the power.



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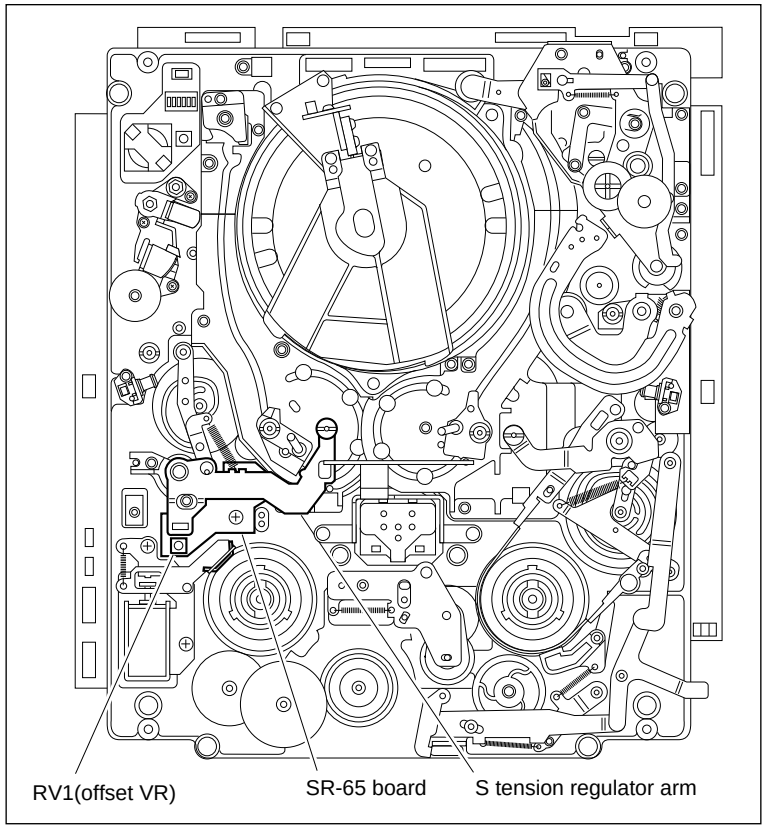
Adjustment

1. S tension regulator offset check

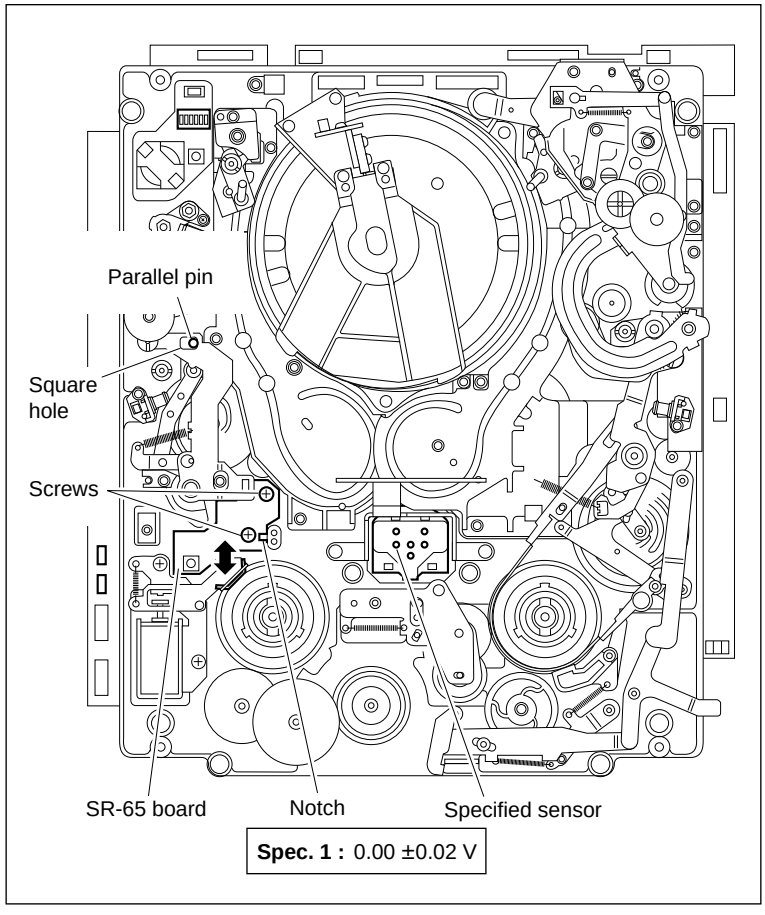
(1) Put the unit into the unthreading end state by pressing the EJECT button.
(2) Adjust the output level at TP700 on the SV-194A board for 0 V using RV1 on the SR-65 board, when the S tension requlator arm is in the unthreading end state.



(3) Put the unit into threading end state by pressing the STOP button.
(4) Insert the parallel pin (d = 2 mm) into the square hole on the S tension regulator arm and the round hole on the mechanical deck.
(5) While keeping the state of step (3), check that the output level at TP700 meets the specification 1.

Specification 1 : 0.00 ±0.02 V

If the specification is met, perform procedure 3 and later.
If not, perform procedure 2 and later.



2. S tension regulator offset adjustment

(1) Loosen the two screws fixing the SR-65 board by one or two turn.
(2) Insert the flatbladed screwdriver (3 mm) into the notch of the SR-65 board, adjust the position of the board to meet the specification 1.
(3) Tighten the two screws loosened in step (1).
Tightening torque :
20×10^{-2} N•m {2.0 kgf•cm}
(4) Recheck the output level at TP700 to meet the specification referring to procedure 1.

3. S tension regulator gain check

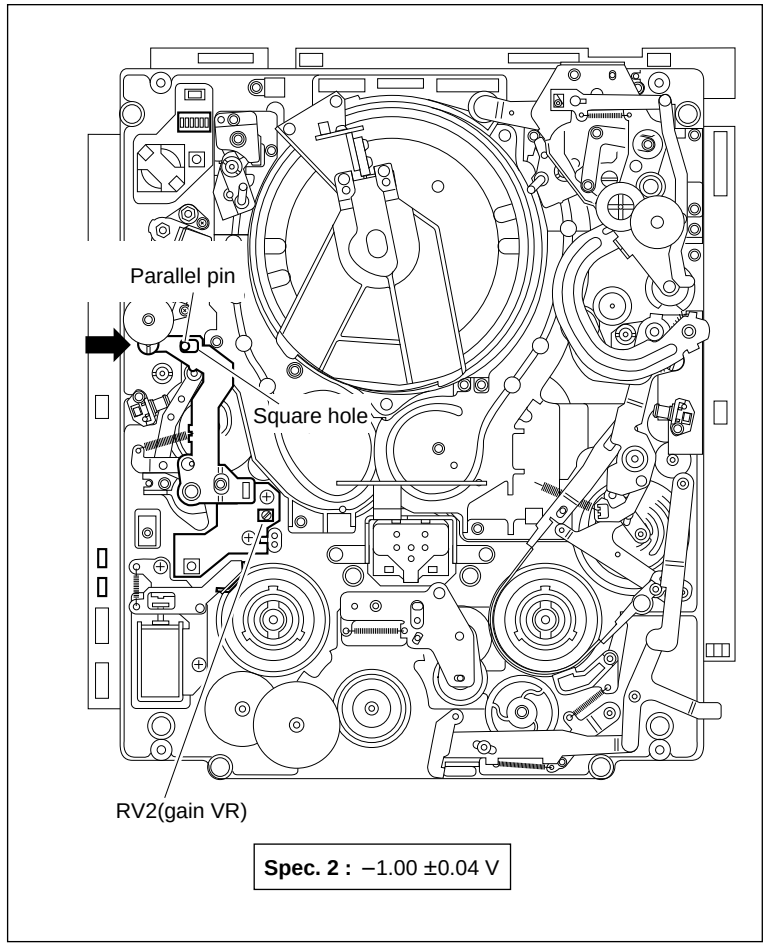
Note

Before performing this check and adjustment, be sure to check that the S tension regulator offset adjustment meets the Specification 1.

(1) Push the S tension regulator arm in the direction indicated by the arrow with finger until the left side of the square hole of the arm contacts with the parallel pin.
(2) While keeping the state of step (1), check the output level at TP700 meets the specification 2.

Specification 2 : −1.00 ±0.04 V

If not to meet the specification, perform step 4.



4. S tension regulator gain adjustment

(1) Adjust RV2 (gain VR) on the SR-65 board to meet the specification 2.
(2) Return to the procedure 1, perform checks and adjustments again.

Note

After checks and adjustments are completed, be sure to set switches S100-1 and S100-2 on the SV-194A board back to OFF.

7-3. Back Tension Check and Adjustment

This section explains the FWD and REV back tension checks and adjustments.
Be sure to perform checks and adjustments after replacing the following parts.

- S reel table
- S reel motor
- S tension regulator arm
- T reel table
- Tension regulator band
- T tension regulator arm
- T soft brake

7-3-1. FWD Back Tension Check and Adjustment

Be sure to perform this check and adjustment when replacing the S reel table, S reel motor and S tension regulator arm, and when performing the S tension regulator offset/gain adjustment.

Tool

- Torque cassette (FWD back ten.) (MW-389) : J-6323-890-A

Preparations

1. Check that the unit is in the unthreading end state.
2. Remove the top plate. (Refer to Section 1-4-1.)
3. Remove the cassette compartment. (Refer to Section 1-5.)
4. Set the switch S100-1 on the SV-194 to ON. (Refer to Section 7-1-8.)
5. Turn on the power.
6. Put the torque cassette on the unit.

   Note

   When measuring torque, push the center of the torque cassette in order to prevent the rise of it.

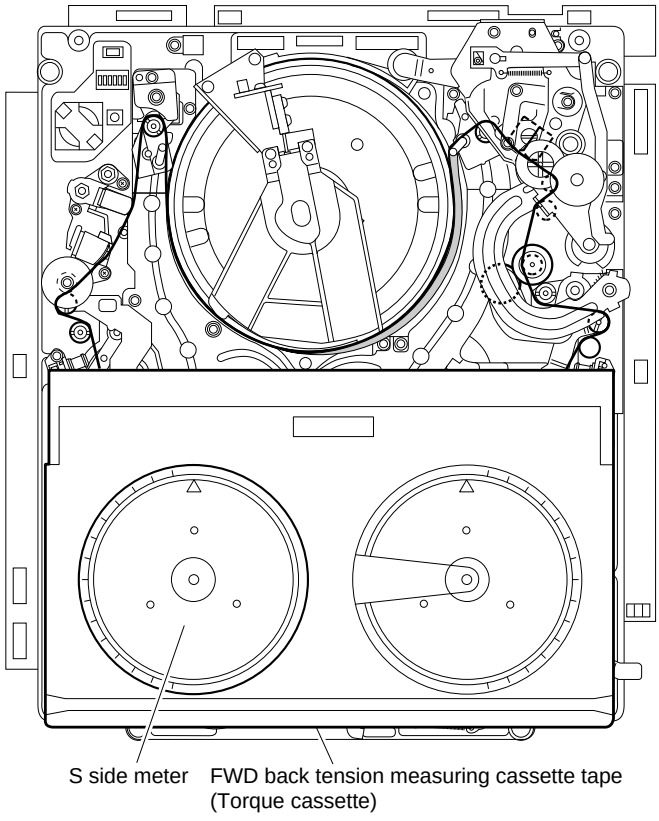
Check

1. FWD back tension check

(1) Press the PLAY button to put the unit into the PLAY mode.
(2) Check that the indication at S side meter of the torque cassette meets the specification.

Specification :
$590 \times 10^{-5} \pm 78 \times 10^{-5}$ N•m (60 ±8 gf•cm)

If not to meet the specification, perform step 2.



Spec. : $590 \times 10^{-5} \pm 78 \times 10^{-5}$ N•m (60 ±8 gf•cm)

Adjustment

2. FWD back tension adjustment

(1) Press the EJECT button to unthreads the tape.
(2) Take out the torque cassette.
(3) Hook the spring on other concave of the hole of S tension regulator drawer arm.

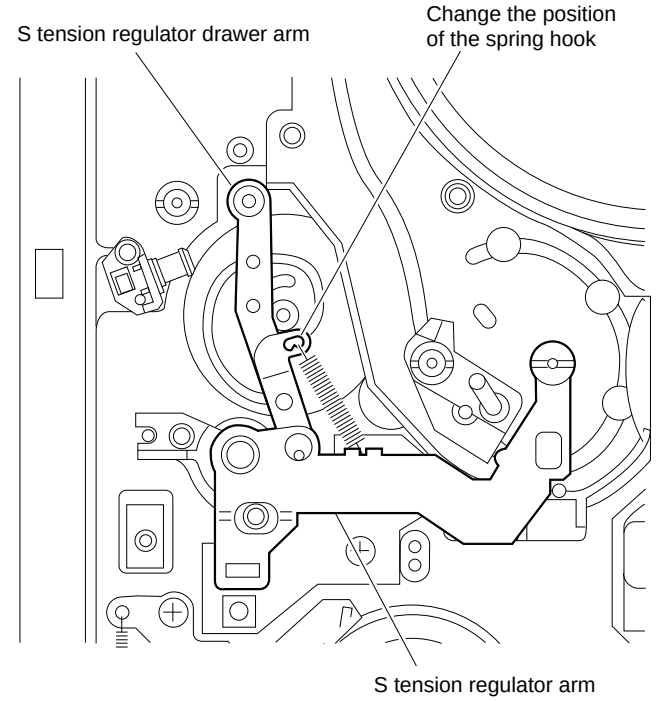
Note

After hooking the spring on another concave, the back tension value deviates by up to ±3 gf•cm from the specification 1.
When the specification is not met even if the spring is hooked on another concave, stretch out (extend) or bend (shorten) the hook of the spring.

(4) Perform the procedure 1 again to recheck the FWD back tension meets the specification.

Note

After check and adjustment are completed, be sure to set switch S100-1 on the SV-194A board back to OFF.



7-3-2. REV Back Tension Check and Adjustment

Be sure to perform this check and adjustment when replacing the T reel table, T tension regulator band and T tension regulator arm.

Tool

- Torque cassette (FWD back ten.) (MW-389) : J-6323-890-A

Preparations

1. Check that the unit is in the unthreading end state.
2. Remove the top plate. (Refer to Section 1-4-1.)
3. Remove the cassette compartment. (Refer to Section 1-5.)
4. Set the switches S100-1 and S100-2 on the SV-194A board to ON. (Refer to Section 7-1-8.)

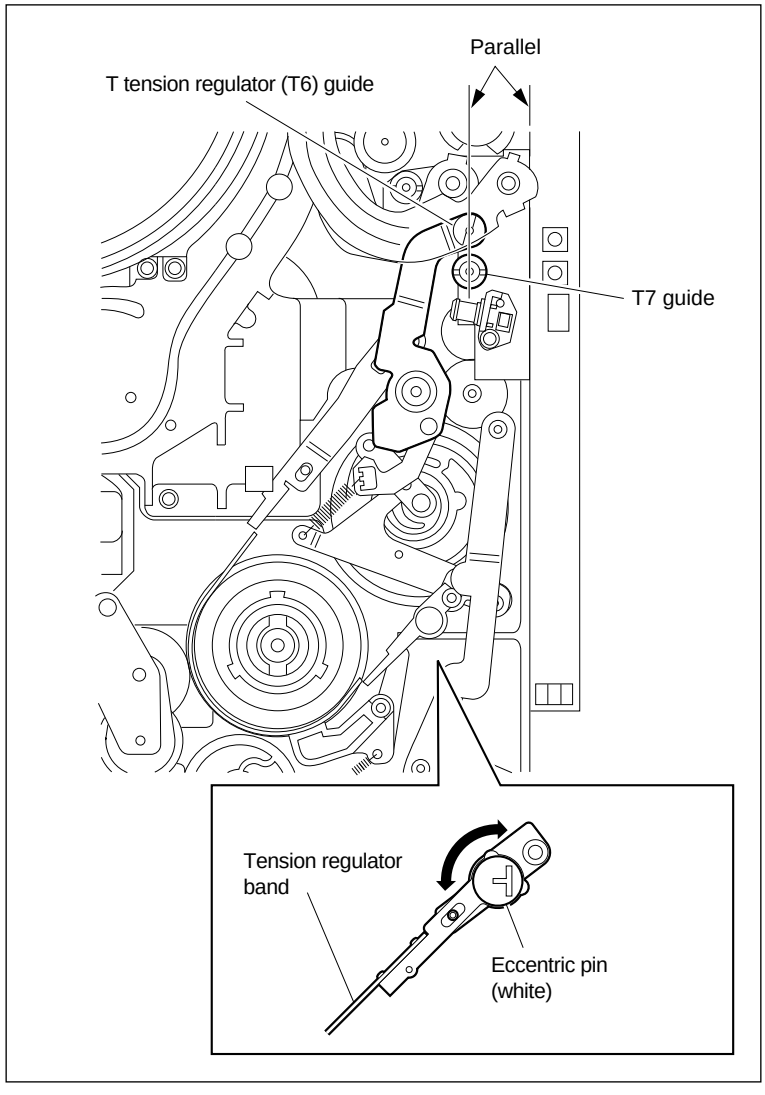
Check

1. T tension regulator arm operating position check

Reference

Adjust the T tension regulator arm operating position by changing the tension regulator band in length.

(1) Turn on the power to put the unit into the threading end state.
(2) Check the positional relationship between the connection line which connect the center-to-center of T tension regulator arm (T6) guide and T7 guide, and the side edge of the mechanical deck is parallel.
(3) If not, adjust the eccentric pin (white) on the tension regulator band using a flatbladed screwdriver until the positional relationship meets.



2. REV back tension check

(1) Put the torque cassette on the unit.

Note

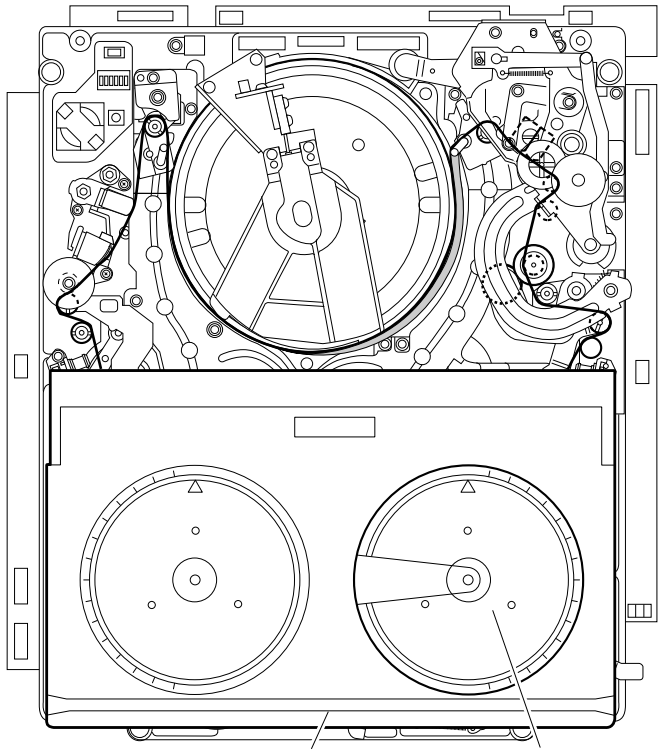
When measuring torque, push the center of the torque cassette in order to prevent the rise of it.

(2) Press the PLAY button to put the unit into the PLAY mode. And then, press the JOG dial and turn it to put the unit into REV×1 mode. (As for switching to the search mode, refer to the operation manual, Section 3-2.)

(3) Check that the indication at T side meter of the torque cassette meets the specification.

Specification :
$490 \times 10^{-5} \pm 49 \times 10^{-5}$ N•m (50 ±5 gf•cm)

If not to meet the specification, perform step 3.



Adjustment

3. REV back tension adjustment

(1) Press the EJECT button to unthreads the tape.

(2) Take out the torque cassette.

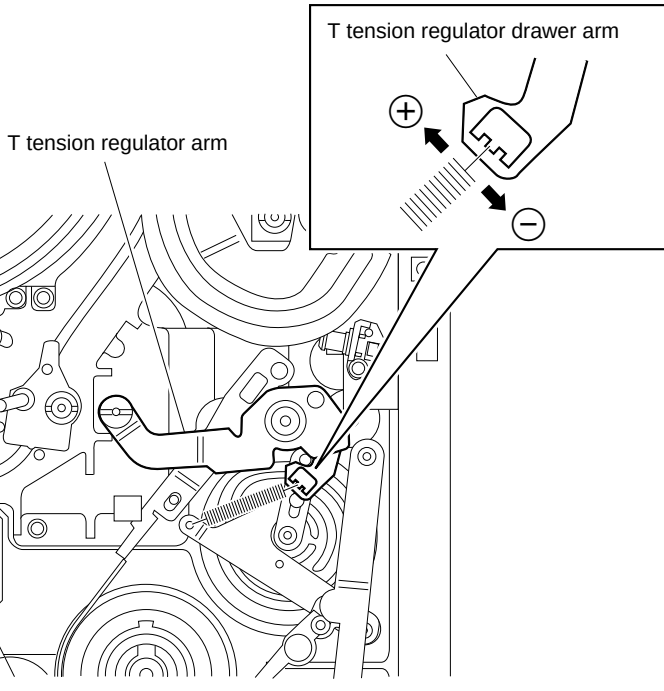
(3) Hook the spring on other concave of the hole of the T tension regulator drawer arm.

- When the meter readout is below the spec. :
  Hook the spring on ⊕ side concave.
- When the meter readout is over the spec. :
  Hook the spring on ⊖ side concave.

(4) Recheck the REV back tension meets the specification according to step 2.

Note

After check and adjustment are completed, be sure to set the switch S100-1 on the SV-194A board back to OFF.



7-4. Tape Running Check and Adjustment

Precaution

The tape running condition is closely related with S reel table height and T reel table height.
Before performing this check and adjustment, be sure to check the S reel table height and T reel table height. (Refer to step 7 in Section 6-7.)

Tools

- Betacam SX tape, BCT-62SXA (Commercially available)
- Inspection mirror : J-6080-840-A
- Tape guide adjustment driver (45) : J-6322-420-A

Preparations

1. Check that the unit is in the unthreading end state.
2. Turn off the power.
3. Remove the top plate. (Refer to Section 1-4-1.)
4. Remove the cassette compartment. (Refer to Section 1-5.)
5. Remove the VH cleaner assembly. (Refer to Section 5-6.)
6. Set the switch S100-1 on the SV-194A board to ON. (Refer to Section 7-1-8.)

   Note

   After check and adjustment are completed, be sure to set the switch S100-1 on the SV-194A board back to OFF.

Check

1. Set S cassette tape

Put the S cassette tape without lid onto the mechanical deck, and then put the weight (about 1000 g) on the cassette tape.

Note

Be sure to fast-rewind the tape in advance.

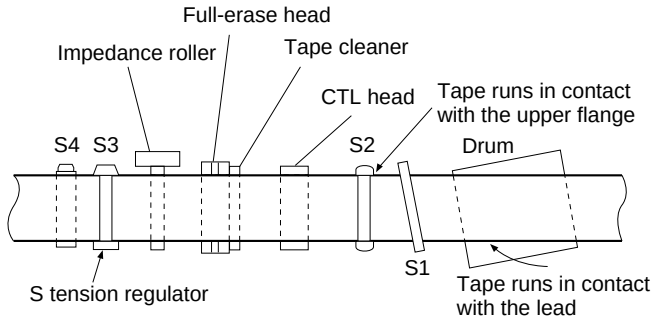
2. Turn on the power.

3. PLAY mode check (At the beginning portion of the tape)

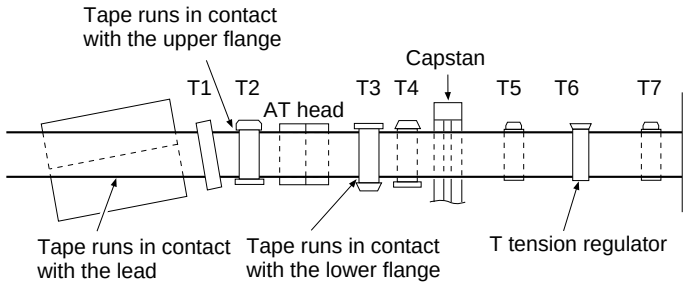
(1) Press the PLAY button to put the unit into the PLAY mode.

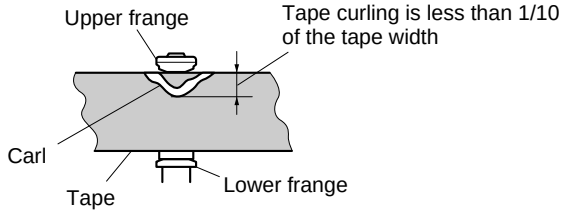
(2) Check the tape running condition satisfies the specification 1.

[Drum entrance side]



[Drum exit side]





Spec. 1 : (PLAY mode at the beginning portion of the tape)

[Drum entrance side]

- S2 guide
  Tape runs in contact with the upper flange.
- S3 guide (S tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If the tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.

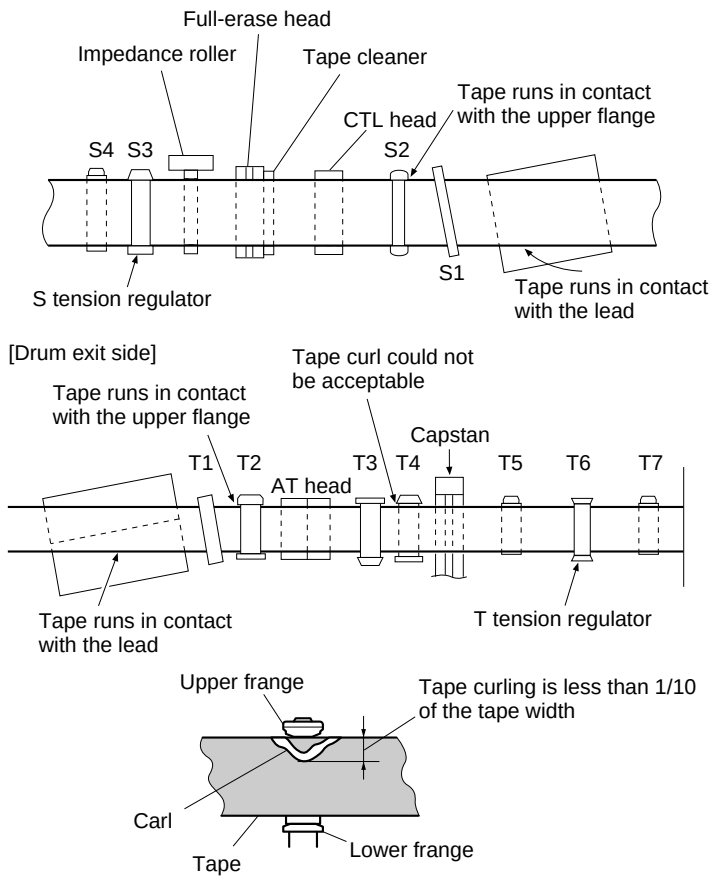
[Drum exit side]

- T2 guide
  Tape runs in contact with the upper flange.
  If tape curl occurs, tape curl is acceptable within the range of less than 1/10 of the tape width.
- T3 guide (T drawer guide)
  Tape runs in contact with the lower flange.
- T4 guide
  Tape runs without contacting the upper and lower flanges.
  Even if the tape runs in contact with the upper or lower flange, tape curl could not be acceptable.
- T6 guide (T tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.

4. F FWD mode check (At the beginning portion of the tape)

(1) Press the FF button to put the unit into the F FWD mode.

(2) Check the tape running condition satisfies the specification 2.



Spec. 2 : (F FWD mode at the beginning portion of the tape)

[Drum entrance side]
- S2 guide
  Tape runs in contact with the upper flange.
- S3 guide (S tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If the tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.

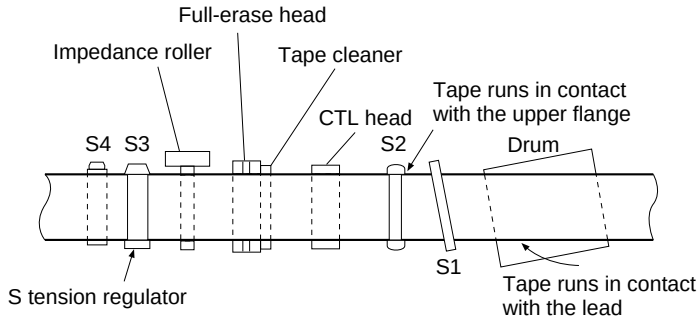
[Drum exit side]
- T2 guide
  Tape runs in contact with the upper flange.
- T3 guide (T drawer guide)
  Tape runs in contact with the lower flange.
  If tape curl occurs, tape curl is acceptable within the range of less than 1/10 of the tape width.
- T4 guide
  Tape runs without contacting the upper and lower flanges.
  Even if the tape runs in contact with the upper or lower flange, tape curl could not be acceptable.
- T6 guide (T tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.

5. REV×1 mode check (At the beginning portion of the tape)

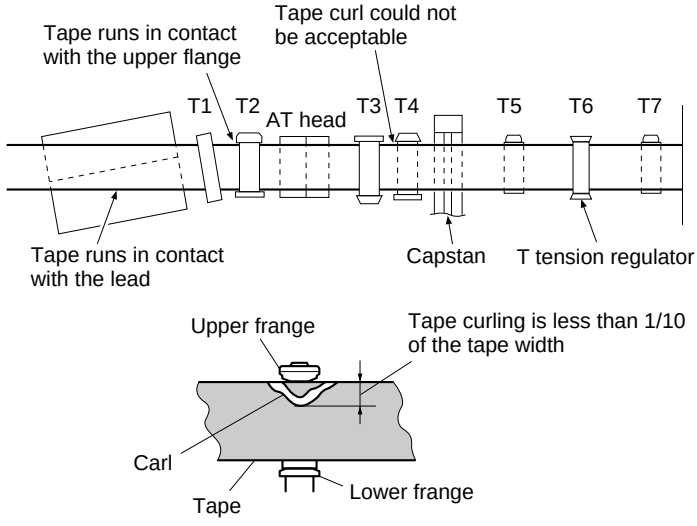
(1) Press the PLAY button, and then press the JOG dial and turn it to put the unit into the REV×1 mode.
(As for switching to the search mode, refer to the operation manual, Section 3-2.)

(2) Check the tape running condition satisfies the specification 3.

[Drum entrance side]



[Drum exit side]



Spec. 3 : (REVx1 mode at the beginning portion of the tape)

[Drum entrance side]
- S2 guide
  Tape runs in contact with the upper flange.
- S3 guide (S tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If the tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.

[Drum exit side]
- T2 guide
  Tape runs in contact with the upper flange.
- T3 guide (T drawer guide)
  Tape runs in contact with the lower flange.
  If tape curl occurs, tape curl is acceptable within the range of less than 1/10 of the tape width.
- T4 guide
  Tape runs without contacting the upper and lower flanges.
  Even if the tape runs in contact with the upper or lower flange, tape curl could not be acceptable.
- T6 guide (T tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.

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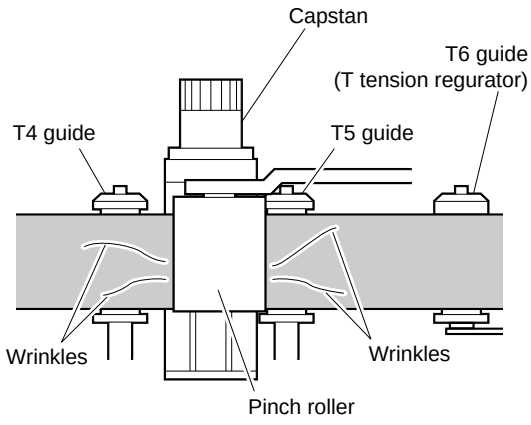
6. Tape running condition check around capstan shaft

(1) Put the unit into the REW mode at the end portion (50 min. to 60 min.) of the S cassette tape (BCT-62SXA). When the rewind speed is put into a uniform, change the mode from REW to PLAY.
Just as the mode was changed, check the tape running condition between T4 guide and capstan shaft, and between capstan shaft and T5 guide meet the specification 4.

(2) Repeat the step (1) three times, and check the tape running conditions meet the specification 4 on every time.
If not, perform procedure 7 and later.

(3) Put the unit into the F FWD mode at the end portion (50 min. to 60 min.) of the S cassette tape (BCT-62SXA). When the fast forward speed is put into a uniform, change the mode from F FWD to PLAY.
Just as the mode was changed, check the tape running condition between T4 guide and capstan shaft, and between capstan shaft and T5 guide meet the specification 4.

(4) Repeat the step (3) three times, and check the tape running conditions meet the specification 4 on every time.
If not, perform step 7 and later.

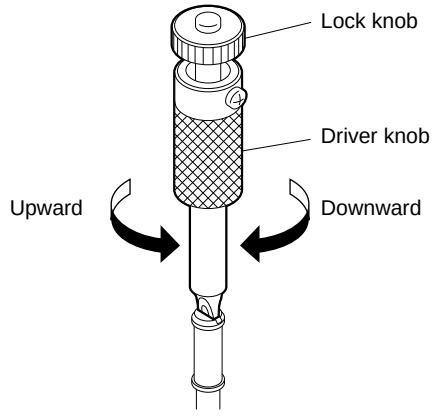


Spec.4 :
Tape runs without any wrinkle.
If the tape wrinkle occurs, confirm the tape wrinkle disappears within 1.5 second and do not damage the tape.

Adjustment

7. Tape guide height adjustment

- In the case that the tape tends to run on upper-end side with the unit switched from PLAY to REW;
  (1) Adjust T6 Guide (T tension regulator) by turning the upper flange 90 degrees clockwise to lower it.
  (2) Check the tape running conditions (by performing the procedures from 1 to 6.)
  (3) If the tape running conditions do not meet the specs 1 to 4, re-perform the tape guide height adjustment. (Do not exceed 180 degrees (twice 90 degrees) when turning the upper flange.)



- In the case that the tape tends to run on lower-end side with the unit switched from PLAY to REW;
  (1) Adjust T6 Guide (T tension regulator) by turning the upper flange 90 degrees counterclockwise to raise it.
  (2) Check the tape running conditions (by performing the steps from 1 to 6.)
  (3) If the tape running conditions do not meet the specs 1 to 4, re-perform the tape guide height adjustment. (Do not exceed 180 degrees (twice 90 degrees) when turning the upper flange.)

8. Recheck of tape running condition

Perform procedures 1 through 6 again, and recheck the tape running conditions meet each specifications.
If not, perform procedure 7 again.

In Case the Adjustment is Performed

9. Video tracking check and adjustment

(Refer to Section 7-5.)

10. CTL head position check and adjustment

(Refer to Section 7-7.)

11. AT head height check and adjustment

(Refer to Section 7-9.)

12. AT head azimuth check and adjustment

(Refer to Section 7-10.)

13. CTL head position check and adjustment

(Refer to Section 7-7.)

14. AT head position check and adjustment

(Refer to Section 7-8.)

Note

After check and adjustment are completed, be sure to set the switch S100-1 on the SV-194A board back to OFF.

7-5. Video Tracking Check and Adjustment

Tools

- Alignment tape SR2-1 (for 525/60 system) : 8-960-075-11
- Alignment tape SR2-1P (for 625/50 system) : 8-960-075-61
- Alignment tape CR2-1B (for analog Betacam, NTSC) : 8-960-960-01
- Alignment tape CR2-1B PS (for analog Betacam, PAL) : 8-960-096-51
- Oscilloscope (Tektronix 2465B or equivalent)
- Inspection mirror : J-6080-840-A
- Tape guide adjustment driver : J-6322-420-A
- HN-257 mounted circuit board : A-8317-304-A

Preparations

1. Turn the power off.

2. Remove the top plate.
(Refer to Section 1-4-1.)

3. Remove the cassette compartment.
(Refer to Section 1-5.)

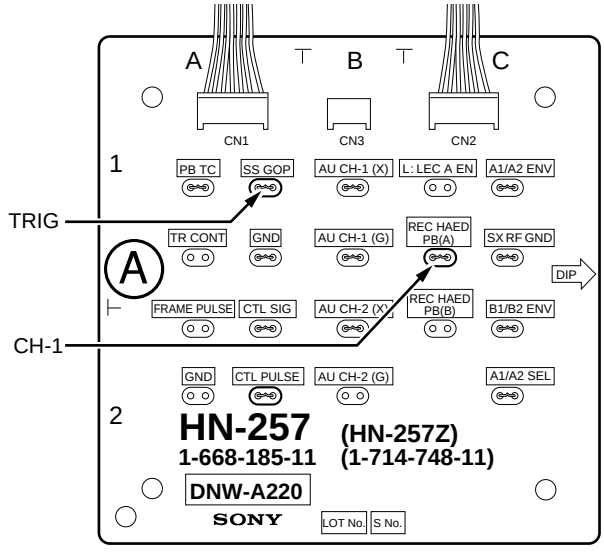
4. Remove the VH cleaner asseembly.
(Refer to Section 5-6.)

5. Connect the HN-257 board (tape path harness).
(Refer to Section 7-1-5.)

6. Connect the oscilloscope.
Connect the oscilloscope as follows (See figure on the right side.);
CH-1 : REC HEAD PB (A)/HN-257 board
TRIG : SS GOP/HN-257 board
Oscilloscope setting :
CH-1 : 100 mV/DIV
TIME : 5 ms/DIV

7. Switch setting
Set the switches S100-1 and S100-2 on the SV-194A board to ON.
(Refer to Section 7-1-8.)

• **Connection of the oscilloscope**



Check

8. Turn the power on

9. Mode setting (Rec head PB)

(1) Press S200 (B-1) on the SY-259B board to enter the unit in the maintenance mode. (Refer to Section 3.)
(2) Turn the Jog dial, put a cursor (*) to "M0 : TAPE MAINTENANCE," and press JOG dial or SET button.
(3) Put the cursor to "A4 MECHANISM" and press JOG dial or SET button.
(4) Put the cursor to "A40 : PATH MODE" and press JOG dial or SET button.
(5) Put the cursor to "Switching PB" and press SET button. Then the "□" mark will be displayed at the upper right corner of the video monitor screen.

Note

Refer to "Section 3 Maintenance Mode" for more information about the maintenance mode.

10. Check the CTL head height

(Refer to Section 7-6.)

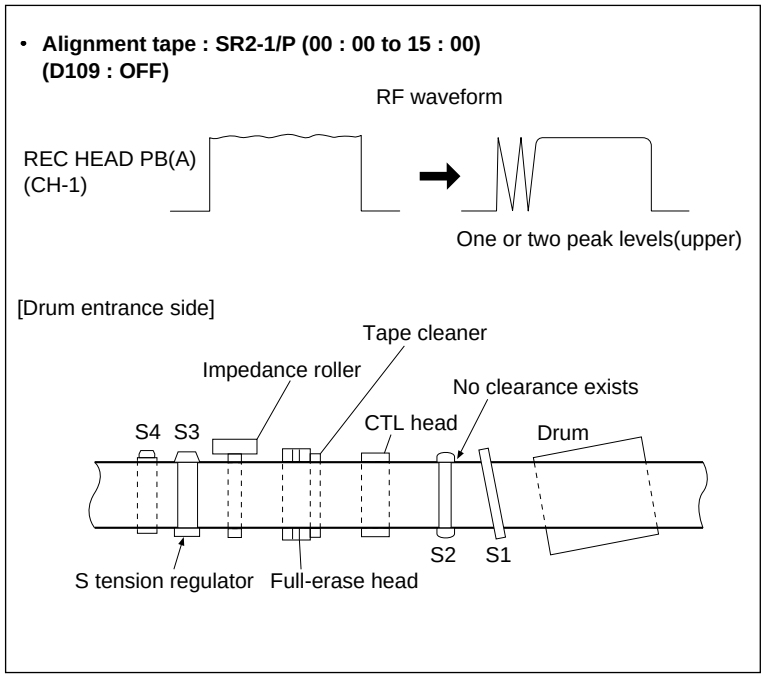
Note

Be sure to perform the CTL head position adjustment when the CTL head height adjustment had adjusted.

11. Tape rising pressure check (S side)

(1) Press in the switch S101 on the SV-194A board and hold it more than three seconds, check that D109 LED goes out. (Refer to Section 7-1-9.)
(2) Play back the SR2-1/P (00 : 00 to 15 : 00).
(3) Turn the upper flange of the S2 guide counter-clockwise using a tape guide adjustment driver so that one or two peak levels are appeared in an RF signal waveform as shown in the figure. At that time, check the following.
    • Check that no clearance exists between the upper flange of S2 guide and upper edge of the tape.

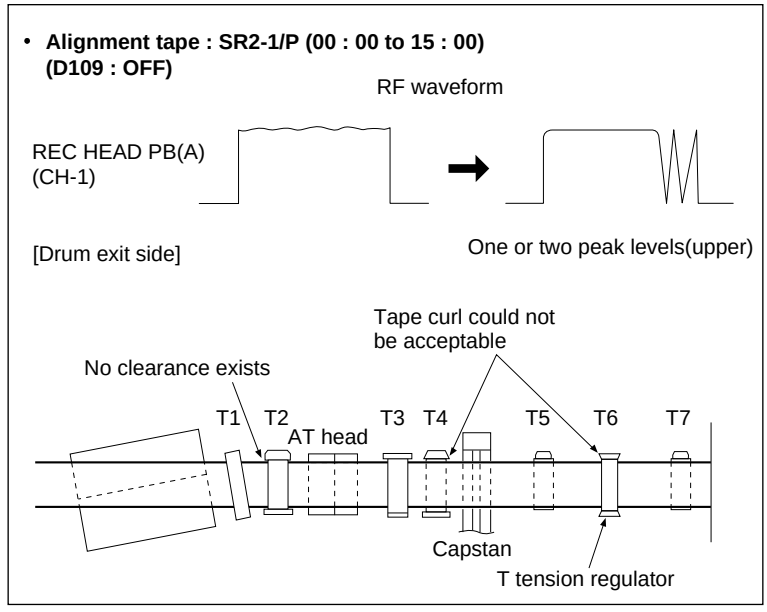
    If they are not satisfied, perform the tape running adjustment (refer to Section 7-4) and video tracking adjustment (refer to procedures 22 and later) to meet both specifications.
(4) Turn the upper flange of S2 guide clockwise so that the RF signal waveform is almost flat.



12. Tape rising pressure check (T side)

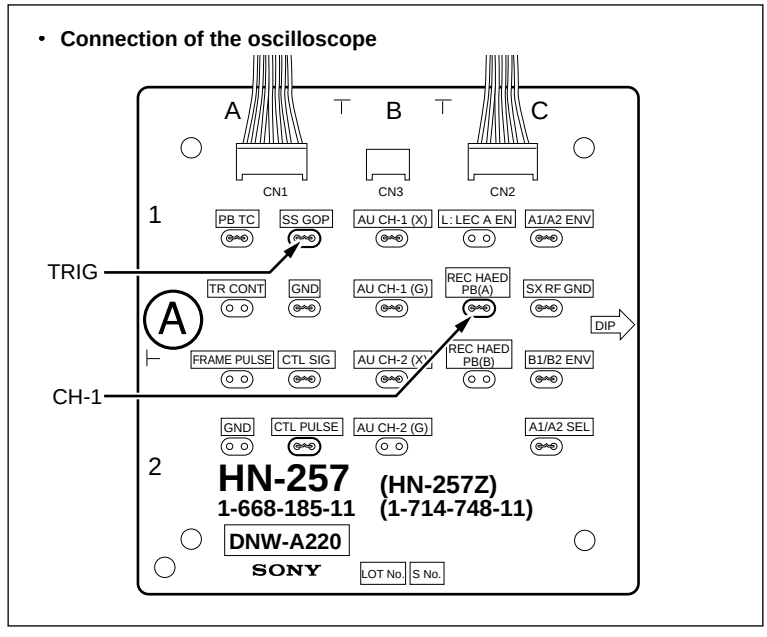
(1) Check to see that D109 LED on the SV-194A board is OFF.
(2) Play back the SR2-1/P (00 : 00 to 15 : 00).
(3) Turn the upper flange of the T2 guide counterclockwise using a tape guide adjustment driver so that one or two peak levels are appeared in an RF signal waveform as shown in the figure. At that time, check the followings.
   - Check that no clearance exists between the upper flange of T2 guide and upper edge of the tape.
   - Check that the tape runs without contacting the upper and lower flanges of the T4 and T6 guides.
     If tape runs in contact with the upper or lower flanges of the T4, and T6 guides, tape curl could not be acceptable.

   If they are not satisfied, perform the tape running adjustment (refer to Section 7-4) and video tracking adjustment (refer to procedures 22 and later) to meet both specifications.
(4) Turn the upper flange of T2 guide clockwise so that the RF signal waveform is almost flat.



13. PLAY mode

(1) Connect the oscilloscope as follows (See figure on the right side.);
   CH-1 : REC HEAD PB (A) /HN-257 board
   TRIG : SS GOP/HN-257 board
   Oscilloscope setting;
   CH-1 : 100 mV/DIV
   TIME : 1 ms/DIV
(2) Play back the SR2-1/P (00 : 00 to 15 : 00).
(3) Press in the switch S101 on the SV-194A board and hold it more than three seconds to enable the tracking VR.



(4) Turn the tracking VR (RV100) on the SV-194A board so that the output level of the center portion of RF envelope waveform is maximized.
(5) Turn the tracking VR (RV100) clockwise so that the center portion of the RF envelope waveform makes 80% of its maximum output level.
(6) While keeping the state of step (5), check that the RF envelope waveform satisfies specification 1.

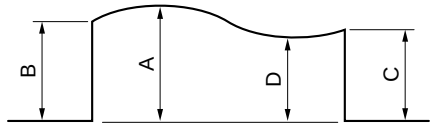
Note

If the level fluctuates, read the average level.

(7) If the level fluctuates, turn the tracking VR (RV100) so that the output level in the center portion of the RF envelope waveform is maximized, and check that the fluctuation amounts satisfy the specification 2.

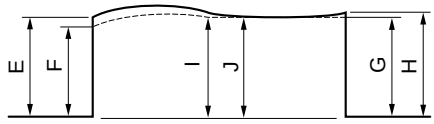
If specifications 1 and 2 are not satisfied, perform the adjustment (at the Drum Entrance Side or the Drum Exit Side) in procedures 22 and later.

- **Alignment tape : SR2-1/P (00 : 00 to 15 : 00) (D109 : ON)**



Spec.1: The output level of the waveform should be more than 80 % of the maximum value.

$\frac{B}{A} \geqq 0.8$, $\frac{C}{A} \geqq 0.8$, $\frac{D}{A} \geqq 0.8$



Spec.2: The fluctuation value in each portion of a waveform should be less than 10 %.

$\frac{F}{E} \geqq 0.9$, $\frac{G}{H} \geqq 0.9$, $\frac{I}{J} \geqq 0.9$

14. F. FWD and REV modes

(1) Press in the switch S101 on the SV-194A board and hold it more than three seconds, and then check that D109 goes out.
(2) Play back the SR2-1/P (00 : 00 to 15 : 00).
(3) Put the unit into the F. FWD×24 mode, and then check that the RF waveform satisfies the specification 3.

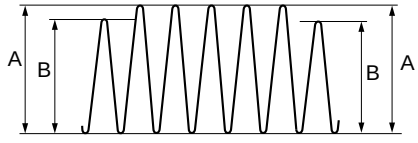
Note

As for swithing to the search mode, refer to the operation manual, Section 3-2.

(4) Put the unit into the REV×24 mode, and then check that the RF waveform satisfies the specification 3.

If specification 3 is not satisfied in each mode, perform the adjustment (at the Drum Entrance Side or the Drum Exit Side) in procedures 22 and later.

- **Alignment tape : SR2-1/P (00 : 00 to 15 : 00) (D109 : OFF)**



Spec. 3: $\frac{B}{A} \times 100 \geqq 80$ %

15. REV×10 mode to PLAY mode

(1) Play back the SR2-1/P (00 : 00 to 15 : 00).
(2) Put the unit into the REV×10 mode. (As for switching to the search mode, refer to the operation manual, Section 3-2.) When the tape becomes a constant speed, put the unit into the PLAY mode.
Make sure that the RF envelope waveform rises uniformly.
(3) Repeat changing the mode REV×10 to PLAY three times, check that the waveform satisfies the specification 4 on every time.

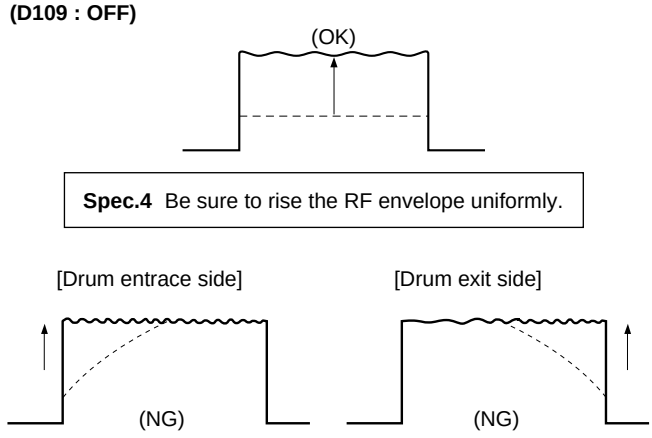
16. Adjust the drum PG phase

(Refer to Section 8-2-1.)

17. Check the PB head head-to-tape contact

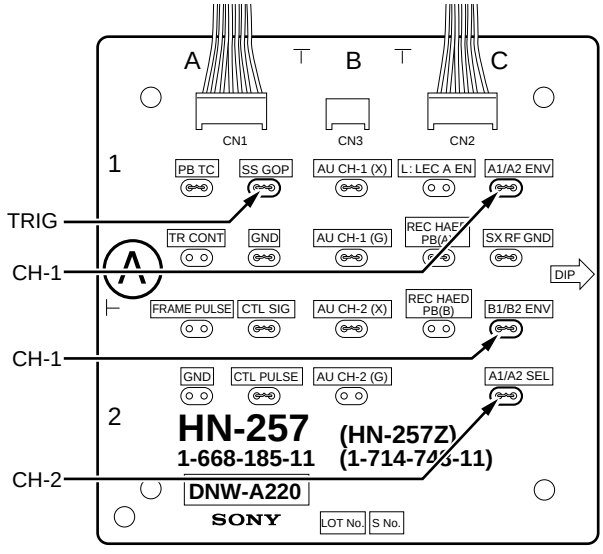
(1) Turn the power off.
(2) Wait about three seconds, and then turn the power on. The REC head PB mode is released due to it.
(3) Connect the oscilloscope as follows (See figure on the right side.);
CH-1 : A1/A2 ENV/HN-257 board
CH-2 : A1/A2 SEL/HN-257 board
TRIG : SS GOP/HN-257 board
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 5 V/DIV
TIME : 2 ms/DIV
(4) Play back the SR2-1/P (20 : 00 to 25 : 00).
(5) Press in the switch S101 on the SV-194A board and hold it more than three seconds to enable the tracking VR.
(6) Turn the tracking VR (RV100) on the SV-194A board so that the output level at the center portion of the RF waveform of A1 channel is maximized.
(7) Check that the RF waveform of A1 channel satisfies the specification 5.
(8) Maximize the output level of the RF waveform of A2 channel by turning the tracking VR (RV100) on the SV-194A board, check that the RF waveform of A2 channel satisfies the specification 5.
(9) Change the connection of CH-1 of the oscilloscope to TP "B1/B2 ENV" on the HN-257 board, and then perform the check from steps (6) through (8) in the same way.

• **Alignment tape : SR2-1/P (00 : 00 to 15 : 00) (D109 : OFF)**

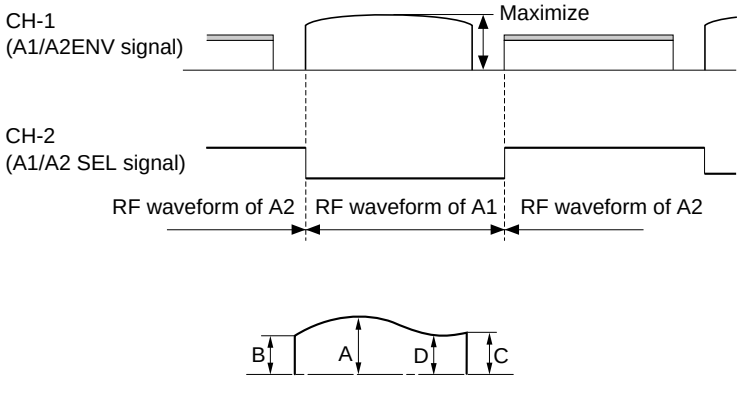


Spec.4 Be sure to rise the RF envelope uniformly.

• **Connection of the oscilloscope**



• **Alignment tape : SR2-1/P (20 : 00 to 25 : 00) (D109 : ON)**



Spec. 5: The output level of the waveform should be more than 80 % of the maximum value.

$\frac{B}{A} \geqq 0.8$, $\frac{C}{A} \geqq 0.8$, $\frac{D}{A} \geqq 0.8$

18. Check the Y/C head head-to-tape contact

(1) Connect the oscilloscope as follows (See figure on the right side.);
CH-1 : A1/A2 ENV/HN-257 board
CH-2 : B1/B2 ENV/HN-257 board
TRIG : A1/A2 SEL/HN-257 board
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 to 2 ms/DIV

(2) Press the EJECT button and take out the SR2-1/P to put the unit into the unthreading end state. And then, the tracking control becomes fixed condition.
Check that D109 LED on the SV-194A board is OFF.

(3) Insert the CR2-1B/PS.

(4) Press the PLAY button to play back the CR2-1B/PS (any portion). The waveform is displayed on the oscilloscope as shown in the figure.

(5) Check that the RF waveforms of Ya, Yb, Ca, and Cb satisfy the specification 6.

The video tracking checks are all satisfied the specifications, perform the following adjustment. If not, perform the procedures 22 and later,

19. Adjust the AT head position

(Refer to Section 7-8.)

20. Check the AT head height

(Refer to Section 7-9.)

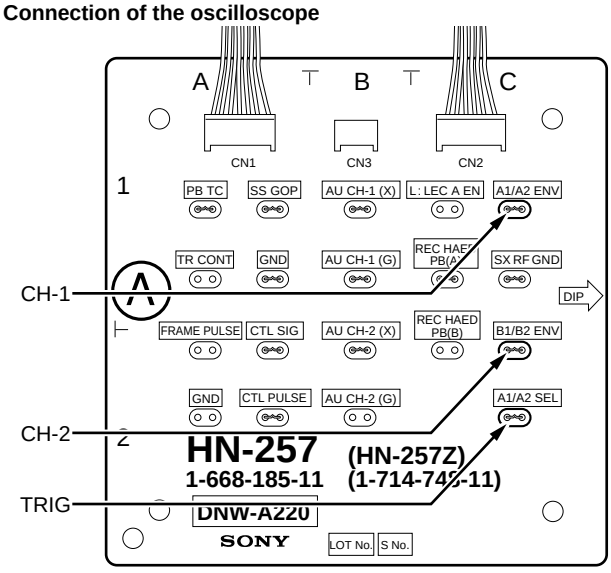
Note

Be sure to adjust the AT head position after the AT head height adjustment.

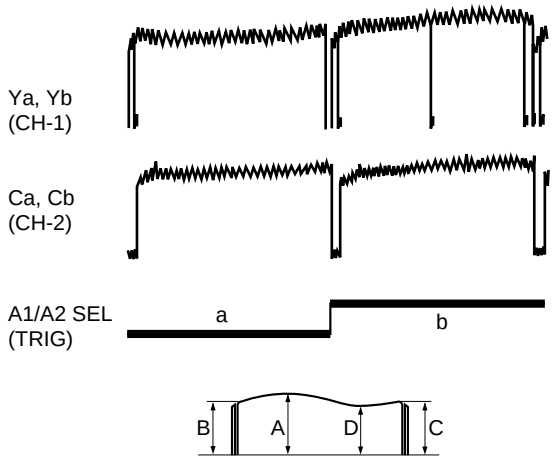
21. Check the AT head azimuth

(Refer to Section 7-10.)

- **Connection of the oscilloscope**



- **Alignment tape : CR2-1B/PS (D109 : OFF)**



Spec. 6: The output level of the waveform should be more than 85 % of the maximum value.

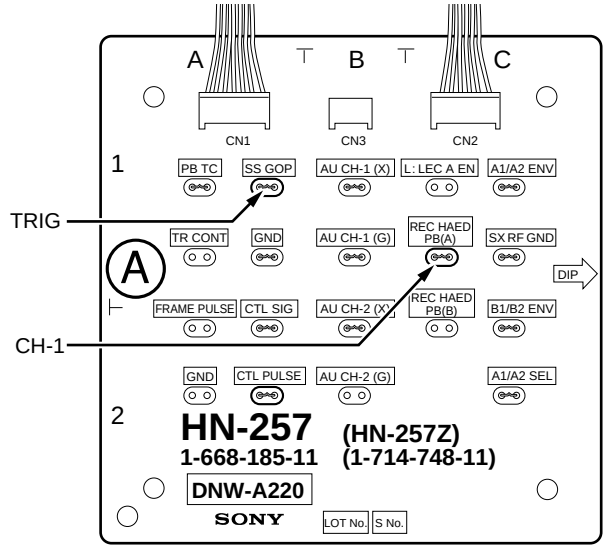
$$\frac{B}{A} \geqq 0.85 \quad , \quad \frac{C}{A} \geqq 0.85 \quad , \quad \frac{D}{A} \geqq 0.85$$

Adjustment

22. Tracking adjustment on drum entrance side

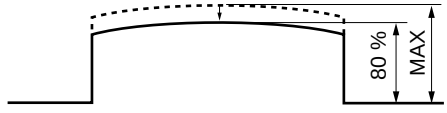
(1) Put the unit into the REC head PB mode. (Refer to the procedure 9)
(2) Connect the oscilloscope as follows (See figure on the right side.);
CH-1 : REC HEAD PB(A)/HN-257 board
TRIG : SS GOP/HN-257 board
Oscilloscope setting;
CH-1 : 100 mV/DIV
TIME : 5 ms/DIV
(3) Press in the switch S101 on the SV-194A board and hold it more than three seconds to enable the tracking VR.
(4) Play back the SR2-1/P (00 : 00 to 15 : 00).
(5) Turn the tracking VR (RV100) so that the output level at the center portion of the RF envelope waveform is maximized.
(6) Turn the tracking VR (RV100) on the SV-194A board clockwise so that the center portion of the RF envelope waveform makes 80% of its maximum output level.
(7) Loosen the setscrew on the S2 guide and adjust the height of the S2 guide so that the envelope waveform satisfies the specifications 7 and 8.
If it is not satisfied, perform the tape running adjustment (refer to Section 7-4) and this procedure to meet both specifications.
(8) Tighten the setscrew on the S2 guide.
Tightening torque :
9×10^{-2} N•m {0.9 kgf•cm}

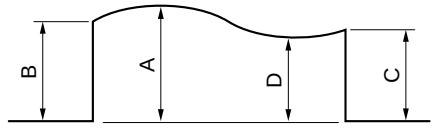
• **Connection of the oscilloscope**



• **Alignment tape : SR2-1/P (00 : 00 to 15 : 00) (D109 : ON)**

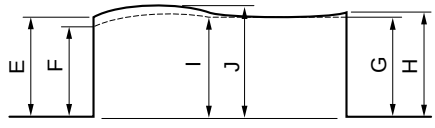
RF envelope waveform





Spec. 7: The output level of the waveform should be more than 80 % of the maximum value.

$\frac{B}{A} \geqq 0.80$, $\frac{C}{A} \geqq 0.80$, $\frac{D}{A} \geqq 0.80$



Spec. 8: The fluctuation value in each portion of a waveform should be less than 10 %.

$\frac{F}{E} \geqq 0.9$, $\frac{G}{H} \geqq 0.9$, $\frac{I}{J} \geqq 0.9$

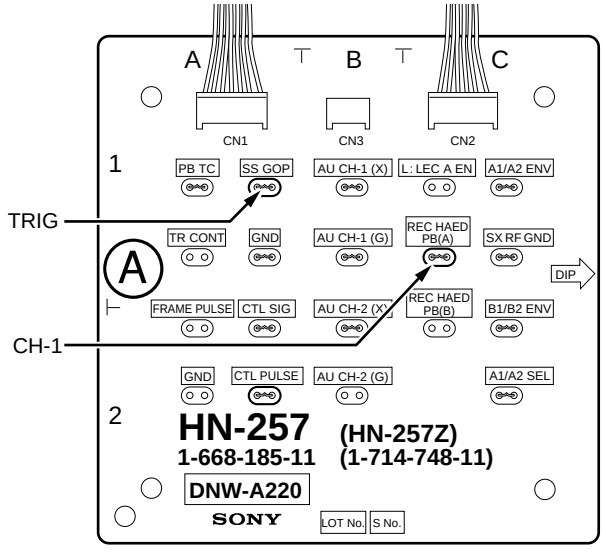
23. Tracking adjustment on drum exit side

(1) Put the unit into the REC head PB mode. (Refer to the procedure 9.)
(2) Connect the oscilloscope as follows (See figure on the right side.);
CH-1 : REC HEAD PB(A)/HN-257 board
TRIG : SS GOP/HN-257 board
Oscilloscope setting;
CH-1 : 100 mV/DIV
TIME : 5 ms/DIV
(3) Press in the switch S101 on the SV-194A board and hold it more than three seconds to enable the tracking VR.
(4) Play back the SR2-1/P (00 : 00 to 15 : 00).
(5) Turn the tracking VR (RV100) on the SV-194A board so that the output level at the center portion of the RF envelope waveform is maximized.
(6) Turn the tracking VR (RV100) clockwise so that the center portion of the RF envelope waveform makes 80% of its maximum output level.
(7) Loosen the setscrew on the T2 guide and adjust the height of the T2 guide so that the envelope waveform satisfies the specifications 9 and 10.
If it is not satisfied, perform the tape running adjustment (refer to Section 7-4) and this procedure to meet both specifications.
(8) Tighten the setscrew on the T2 guide.
Tightening torque :
9×10^{-2} N•m {0.9 kgf•cm}

Note

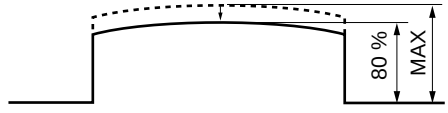
After adjustment are completed, be sure to set the switch S100-1 back to OFF position.

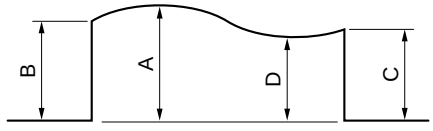
- **Connection of the oscilloscope**



- **Alignment tape : SR2-1/P (00 : 00 to 15 : 00) (D109 : ON)**

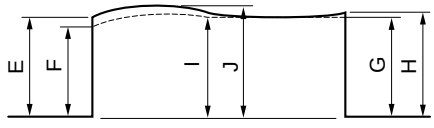
RF envelope waveform





Spec. 9: The output level of the waveform should be more than 80 % of the maximum value.

$$\frac{B}{A} \geqq 0.80 \quad , \quad \frac{C}{A} \geqq 0.80 \quad , \quad \frac{D}{A} \geqq 0.80$$



Spec. 10: The fluctuation value in each portion of a waveform should be less than 10 %.

$$\frac{F}{E} \geqq 0.9 \quad , \quad \frac{G}{H} \geqq 0.9 \quad , \quad \frac{I}{J} \geqq 0.9$$

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7-6. CTL Head Height Check and Adjustment

Tools

- Alignment tape SR2-1 (For 525/60 system) : 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system) : 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)
- Nutdriver (d = 4.5 mm) : 7-700-751-01
- HN-257 mounted circuit board : A-8317-304-A

Preparations

1. Turn the power off

2. Connect the oscilloscope

Connect the oscilloscope as follows (See figure on the right side.);
CH-1 : CTL SIG / HN-257 board
TRIG : SS GOP / HN-257 board
Oscilloscope setting :
CH-1 : 2 V/DIV
TIME : 5 ms/DIV

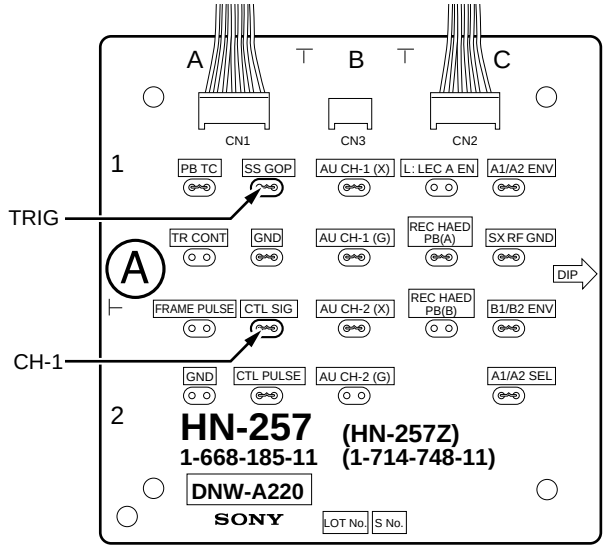
3. Switch setting

Set the switch S100-1 on the SV-194A board to ON.
(Refer to Section 7-1-8.)

4. Set the alignment tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
(Weight about 1000 g is suitable.)

- **Connection of the oscilloscope**



Check

5. Turn the power on

6. Play back the alignment tape

Play back the SR2-1/P (15 : 00 to 27 : 00).

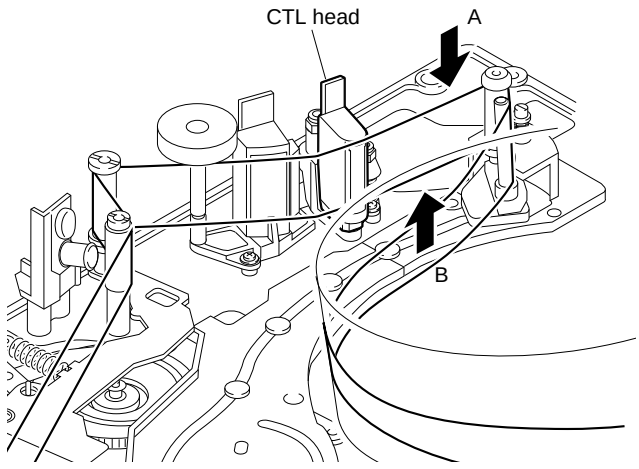
7. Check the CTL head height

(1) Check that the level decreases when portion A of the tape shown in the figure is pressed down.

If the level increases, perform step 8.

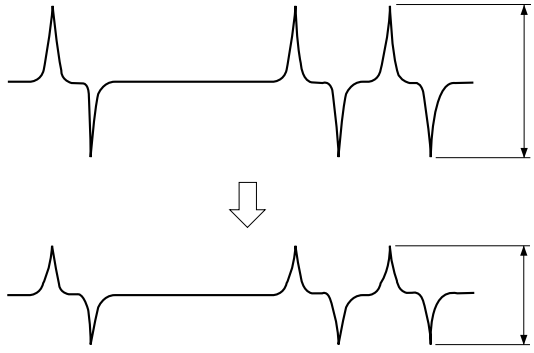
(2) Check that the level decreases when portion B of the tape is pushed up.

If the level increases, perform step 9.



- **Alignment tape : SR2-1/P (15 : 00 to 27 : 00)**

<CTL output waveform>



Spec. : The level decreases when pressing down and pushing up the alignment tape.

Adjustment

8. In case the level increases when the tape is pressed down

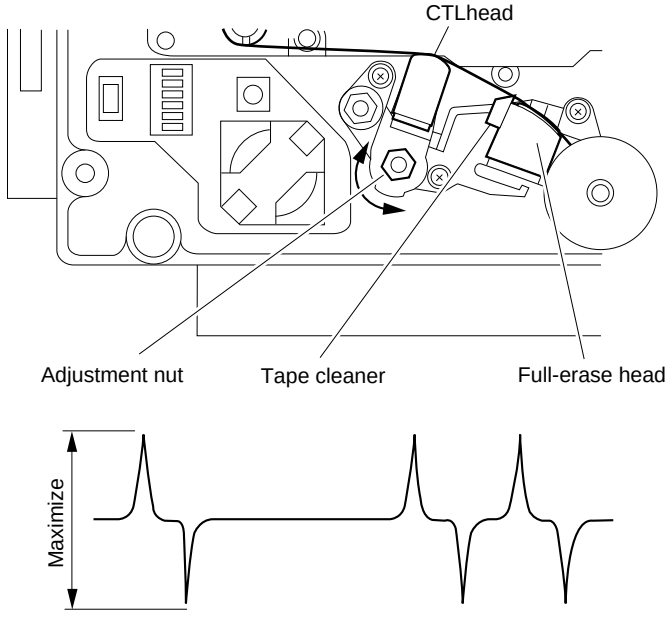
Turn the adjustment nut counterclockwise and adjust so that the output waveform is maximum.
And at that time, check the output level is 5 Vp-p or more.

9. In case the level increases when the tape is pushed Up

Turn the adjustment nut clockwise and adjust so that the output waveform is maximum.
And at that time, check the output level is 5 Vp-p or more.

Note

After adjustment are completed, be sure to set the switch S100-1 back to OFF position.



7-7. CTL Head Position Check and Adjustment

Note

The CTL head position adjustment is closely related to the AT head position adjustment.
Be sure to confirm the AT head position when the CTL head position is adjusted.

Tools

- Alignment tape SR2-1 (For 525/60 system) : 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system) : 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)
- Nutdriver (d = 4.5 mm) : 7-700-751-01
- HN-257 mounted circuit board : A-8317-304-A

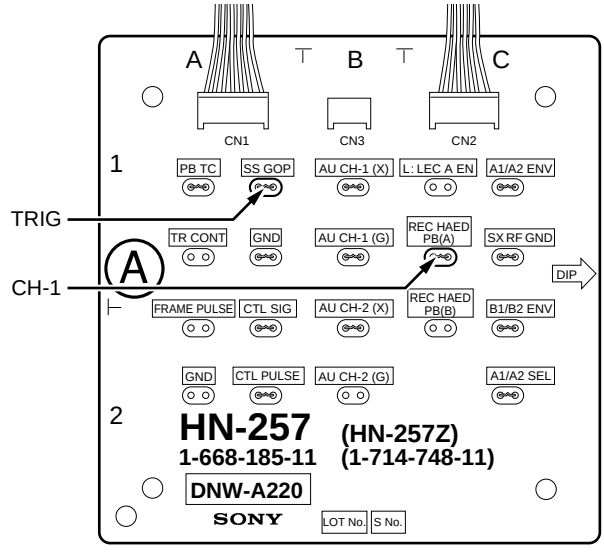
Preparations

1. Turn the power off

2. Connect the oscilloscope

Connect the oscilloscope as follows (See figure on the right side.);
CH-1 : REC HEAD PB (A) / HN-257board
TRIG : SS GOP / HN-257board
Oscilloscope setting :
CH-1 : 1 V to 200 mV/DIV
TRIG : 5 V/DIV
TIME : 5 ms/DIV

- **Connection of the oscilloscope**



3. Switch setting

Set the switch S100-1 on the SV-194A board to ON. (Refer to Section 7-1-8.)

4. Set the alignment tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

Check

5. Turn the power on

6. Mode setting (REC head PB)

(1) Press S200 (B-1) on the SY-259B board to enter the unit in the maintenance mode. (Refer to Section 3.)
(2) Turn the Jog dial, put a cursor (∗) to "M0 : TAPE MAINTENANCE," and then press the JOG dial or SET button.
(3) Put the cursor to "A4 MECHANISM" and press the JOG dial or SET button.
(4) Put the cursor to "A40 : PATH MODE" and press the JOG dial or SET button.
(5) Put the cursor to "Switching PB" and press the SET button. Then the "□" mark will be displayed at the upper right corner of the video monitor screen.

Note

Refer to "Section 3 Maintenance Mode" for more information about the maintenance mode.

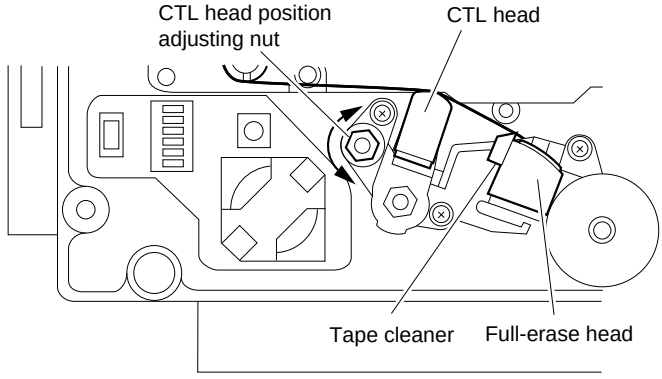
7. Play back the alignment tape

Play back the SR2-1/P (00 : 00 to 15 : 00).

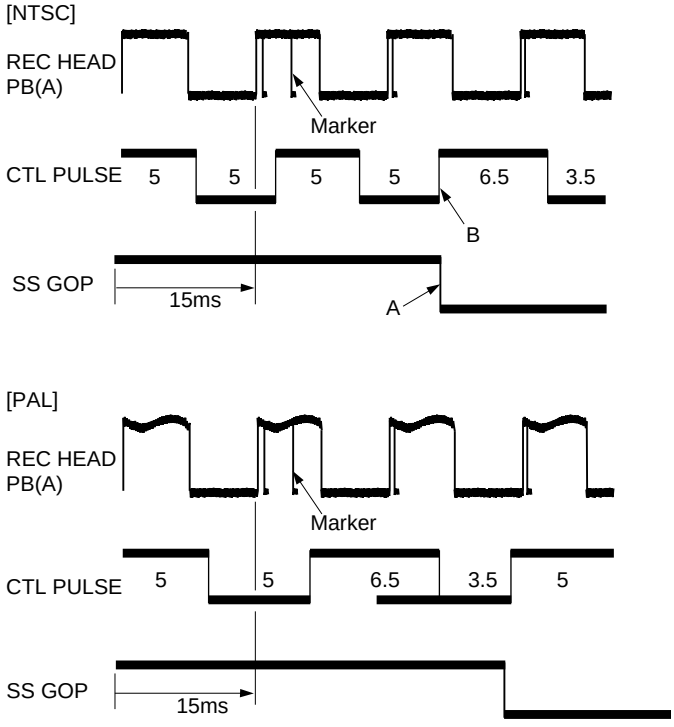
8. Check the CTL head position

(1) Check that the marker exists in the RF waveform that comes 15 ms. later than the rising edge of the SS GOP signal.
(2) Pless in the switch S101 on the SV-194A board and hold it more than three seconds to enable the tracking VR.
(3) Turn the RV100 (tracking VR) on the SV-194A board so that the output level at the center portion of the RF envelope waveform is maximum and read the maximum level as Lv.
(4) Press in the three seconds switch S101 on the SV-194A board and hold it more than three seconds to fix the tracking VR.
(5) Read the output level at the center portion of the RF envelope waveform as L_F.
(6) Check that the levels Lv and L_F satisfy the specification 2.

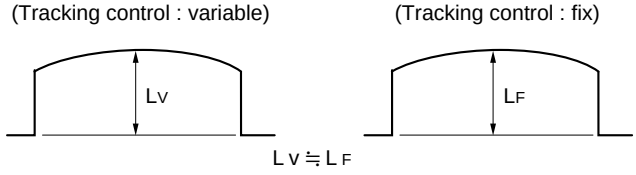
If the specification is not satisfied, perform procedures 9 and later.



- **Alignment tape : SR2-1/P (00 : 00 to 15 : 00) (D109 : ON)**



Spec.1: The marker exists in the RF waveform that comes 15 ms. later than the rising edge of the SS GOP signal.



Spec.2: When the tracking VR set to fix, the output level at the center portion of the RF envelope waveform (L_F) is equal to the maximum output level (Lv) under the state of the tracking is effective.

Adjustment

Note

Perform the adjustment described below under the state of the tracking VR is not effective. (Refer to Section 7-1-9.)

9. Adjust the CTL head position

Turn the CTL head position adjusting nut using nutdriver so that the output level at the center portion is maximum and the marker exists in the RF envelope waveform that comes 15 ms later than the rising edge of the SS GOP signal.

10. Recheck the CTL head position

Perform to procedures 6 through 8 again.

11. Check the CTL head height

(Refer to Section 7-6.)

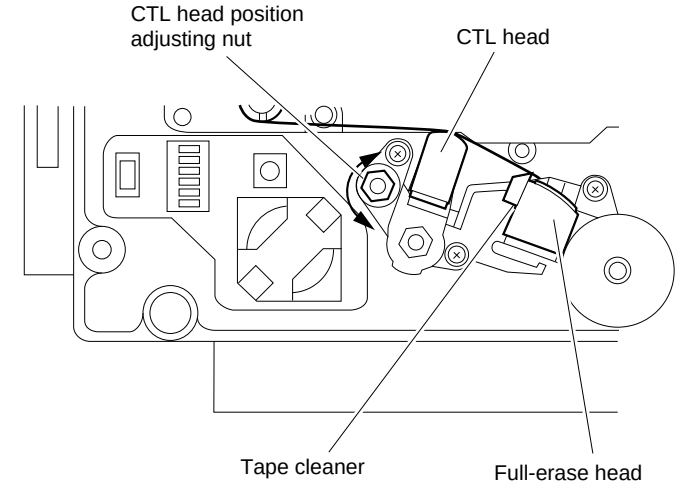
After above Adjustments

12. Adjust the AT head position

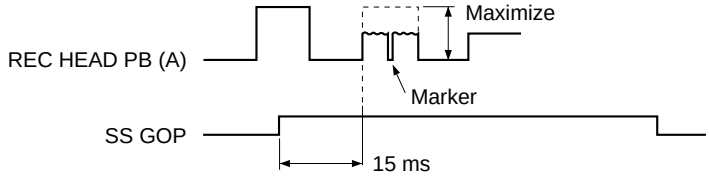
(Refer to Section 7-8.)

Note

After adjustment are completed, be sure to set the switch S100-1 back to OFF position.



- **Alignment tape : SR2-1/P (00 : 00 to 15 : 00)**
  (D109 : ON)



7-8. AT Head Position Check and Adjustment

Notes

- The CTL head position adjustment of section 7-7 should be completed before performing this adjustment. The AT head position is adjusted with the CTL head position as a reference.
- The AT head position adjustment is closely related to the head height adjustment, and head azimuth adjustment.
  Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head position is adjusted.

Tools

- Alignment tape SR2-1 (For 525/60 system) : 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system) : 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)
- HN-257 mounted circuit board : A-8317-304-A

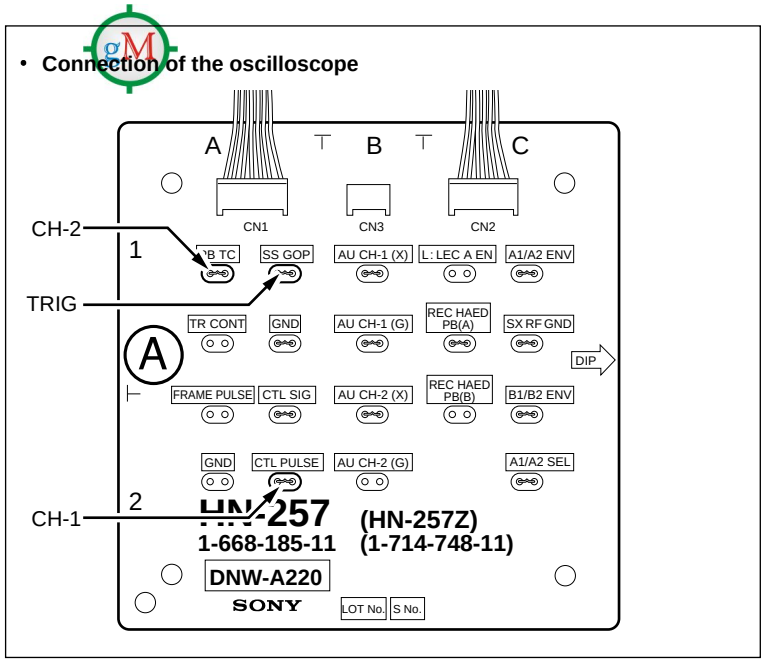
Preparation

1. Turn the power off

2. Connect the oscilloscope

Connect the oscilloscope as follows (See figure on the right side.);
CH-1 : CTL PULSE / HN-257 board
CH-2 : PB TC / HN-257 board
TRIG : SS GOP / HN-257 board
Oscilloscope setting :
CH-1 : 5 V/DIV
CH-2 : 1 V/DIV
TIME : 5 ms to 500 µs/DIV

- **Connection of the oscilloscope**



3. Switch setting

Set the switch S100-1 on the SV-194A board to ON. (Refer to Section 7-1-8.)

4. Set the alignment tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
(Weight about 1000 g is suitable.)

Check

5. Turn the power on

6. Play back the alignment tape

Play back the SR2-1/P (00 : 00 to 15 : 00).

7. Check the AT head position

Check that the positional relationship between the rising edges of CTL's 65 : 35 pulse and PB TC's 65 : 35 waveform signals satisfies the specification.
If the specification is not satisfied, perform procedures 8 and later.

Adjustment

8. Loosen the screws

Loosen the securing screw shown in the figure by a turn.

9. Adjust the AT head position

(1) Insert a 2 mm flatbladed screwdriver into the notch of the AT head assembly.
(2) Adjust the AT head assembly position so that the specification is satisfied.

10. Tighten the screws

Tighten the screw loosened in procedure 8.
Tightening torque : 9×10^{-2} N•m
{0.9 kgf • cm}

11. Recheck the AT head position

Refer to procedures 6 and 7 in this section.

After above Adjustments

12. Check the AT head height

(Refer to Section 7-9.)

13. Check the AT head azimuth

(Refer to Section 7-10.)

14. Check the AT head head-to-tape contact

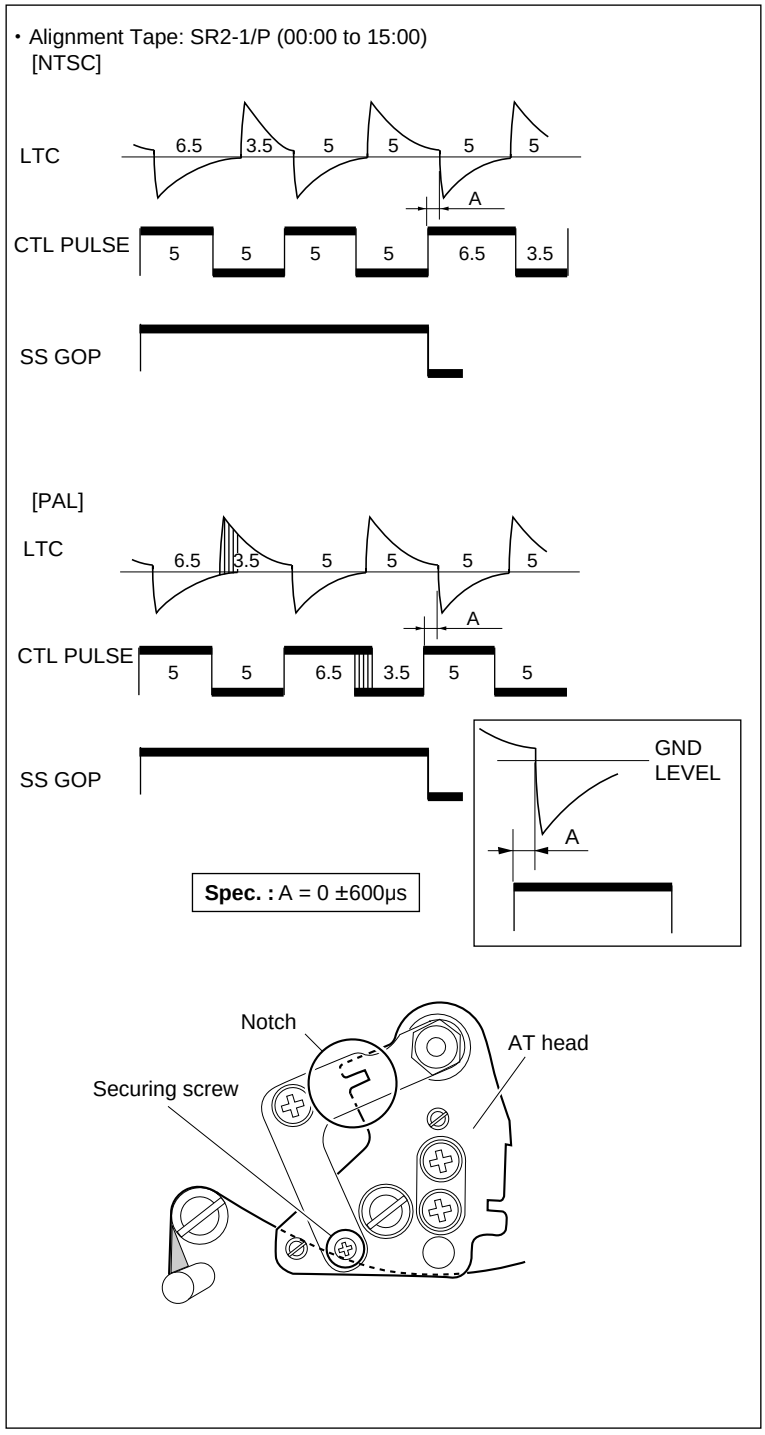
(Refer to Section 7-11.)

15. Check the AT head position

Refer to procedures 6 and 7 in this section.

Note

After adjustment are completed, be sure to set the switch S100-1 back to OFF position.



7-9. AT Head Height Check and Adjustment

Note

The AT head height adjustment is closely related to the azimuth adjustment, and head position adjustment.
Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head height is adjusted.

Tools

- Alignment tape CR8-1A (for analog Betacam, NTSC) : 8-960-097-45
- Alignment tape CR8-1A PS (for analog Betacam, PAL) : 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)
- Nutdriver (d = 4.5 mm) : 7-700-751-01

Preparation

1. Turn the power off

2. Connect the oscilloscope

Connect the oscilloscope as follows (See figure on the right side.);
CH-1 : TP800/PA-218 board
Ground at E800
CH-2 : TP801/PA-218 board
Ground at E801
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms/DIV

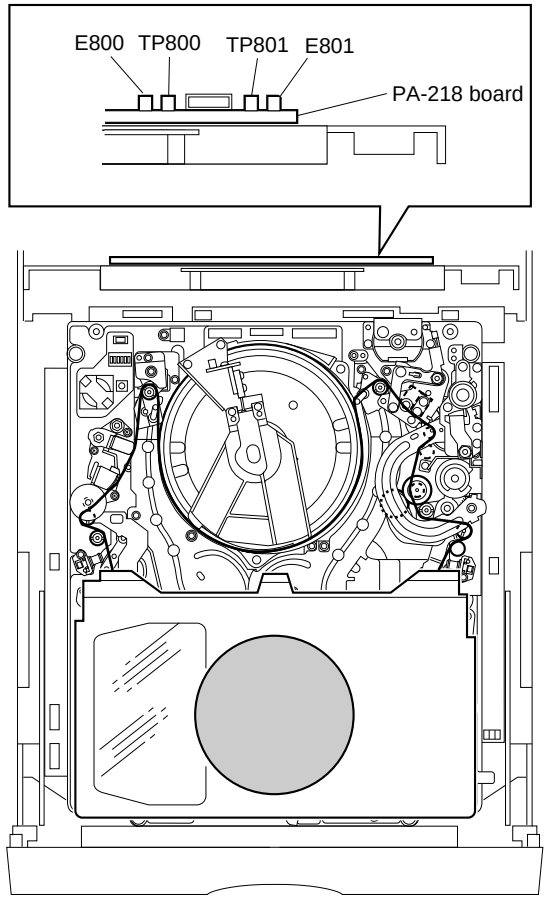
3. Switch setting

Set the switch S100-1 on the SV-194A board to ON. (Refer to Section 7-1-8.)

4. Set the alignment tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- **Connection of th oscilloscope**



Check

5. Turn the power on

6. Play back the alignment tape

Play back the 1 kHz, 0 VU signal portion (8 : 00 to 10 : 00) on the CR8-1A/PS.

7. Check the AT head height

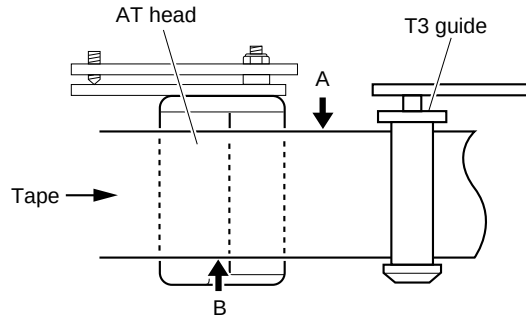
(1) Check that both levels in CH-1 and CH-2 decrease when portion A of the tape shown in the figure is pressed down.

If both levels increase, perform procedure 8.

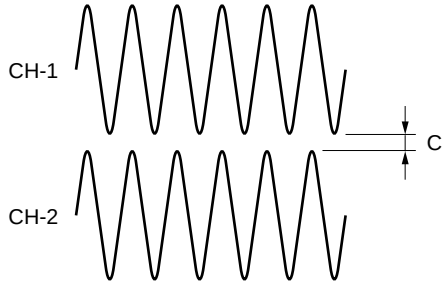
(2) Check that both levels in CH-1 and CH-2 decrease when portion B of the tape is pushed up.

If both levels increase, perform procedure 9.

- **Alignment tape : CR8-1A/CR8-1A PS (8 : 00 to 10 : 00)**



<Audio output waveform>



Spec. : The portion C widens when pressing down and pushing up the alignment tape.

Adjustment

8. In case both levels increase when the tape is pressed down (Fig. 1)

Turn the height adjustment nut counterclockwise so that both output waveforms in CH-1 and CH-2 are maximum.

9. In case both levels increase when the tape is pushed up (Fig. 2)

Turn the height adjustment nut clockwise and adjust so that both output waveforms in CH-1 and CH-2 are maximum.

After above Adjustments

10. Adjust the AT head azimuth (only for the DNW-A25/A25P or the player of the DNW-A220/A220P.)

(Refer to Section 7-10.)

11. Adjust the AT head head-to-tape contact

(Refer to Section 7-11.)

12. Adjust the AT head position

(Refer to Section 7-8.)

13. Recheck the AT head height

(Refer to procedures 6 and 7 in this section.)

14. Re-check the AT head

Perform the procedures 10 to 12 again.

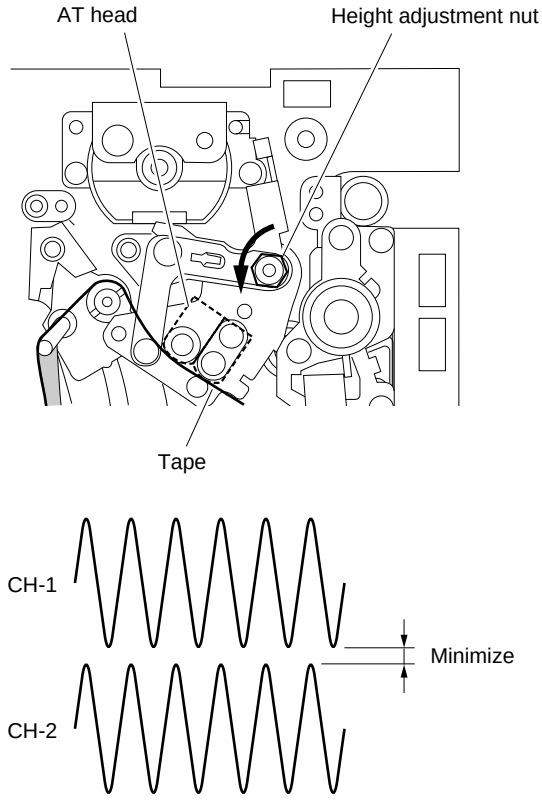
15. Locking compound applying

(Refer to Section 7-1-10.)

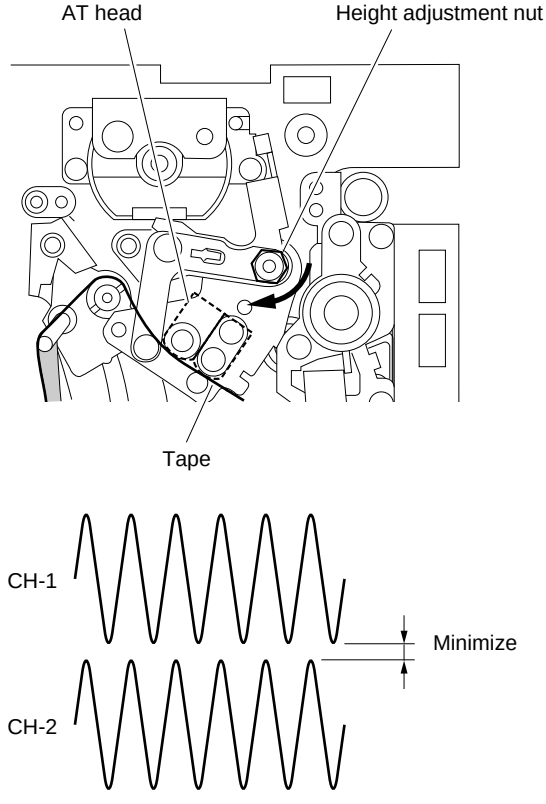
Note

After adjustment are completed, be sure to set the switch S100-1 back to OFF position.

<Fig.1>



<Fig.2>



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7-10. AT Head Azimuth Check and Adjustment

Note

The AT head azimuth adjustment is closely related to head position adjustment and head height adjustment.
Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head azimuth is adjusted.

Tools

- Alignment tape CR8-1A (for analog Betacam, NTSC) : 8-960-097-45
- Alignment tape CR8-1A PS (for analog Betacam, PAL) : 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the power off

2. Connect the oscilloscope

Connect the oscilloscope as follows (See figure on the right side.);
CH-1 : TP800/PA-218 board
Ground at E800
CH-2 : TP801/PA-218 board
Ground at E801
Oscilloscope setting :
CH-1 : 50 mV/DIV
CH-2 : 50 mV/DIV
MODE : X-Y

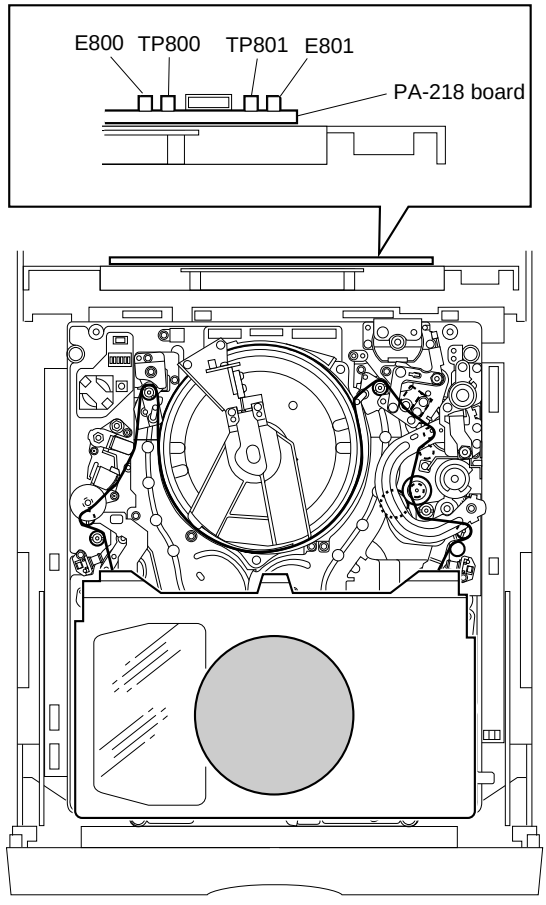
3. Switch setting

Set the switch S100-1 on the SV-194A board to ON. (Refer to Section 7-1-8.)

4. Set the alignment tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
(Weight about 1000 g is suitable.)

- **Connection of the oscilloscope**



Check

5. Turn the power on

6. Play back the alignment tape

Play back the 10 kHz, -10 VU signal portion (3 : 00 to 4 : 55) on the CR8-1A/PS.

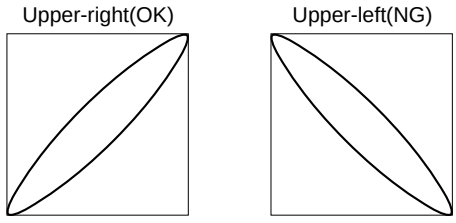
7. Check the AT head azimuth

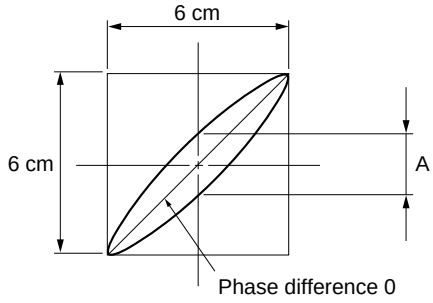
(1) Adjust the horizontal and vertical amplitudes of lissajous waveform to 6 cm each.
(2) Check that the lissajous waveform holds the upper-right shape.
(3) Check that the vertical amplitude at the center point in the horizontal direction satisfies the specification.
(4) Repeat changing the mode STOP to PLAY three times, check that the waveform satisfies the specification on every PLAY mode.
(5) Repeat changing the mode REW to PLAY three times, check that the waveform satisfies the specification on every PLAY mode.
(6) Repeat changing the mode EJECT to PLAY three times, check that the waveform satisfies the specification on every PLAY mode.

If the specification is not satisfied in any steps (3), (4), (5) or (6), perform procedures 8 and later.

- **Alignment tape : CR8-1A/CR8-1A PS (3 : 00 to 4 : 55)**

<Lissajous waveform>



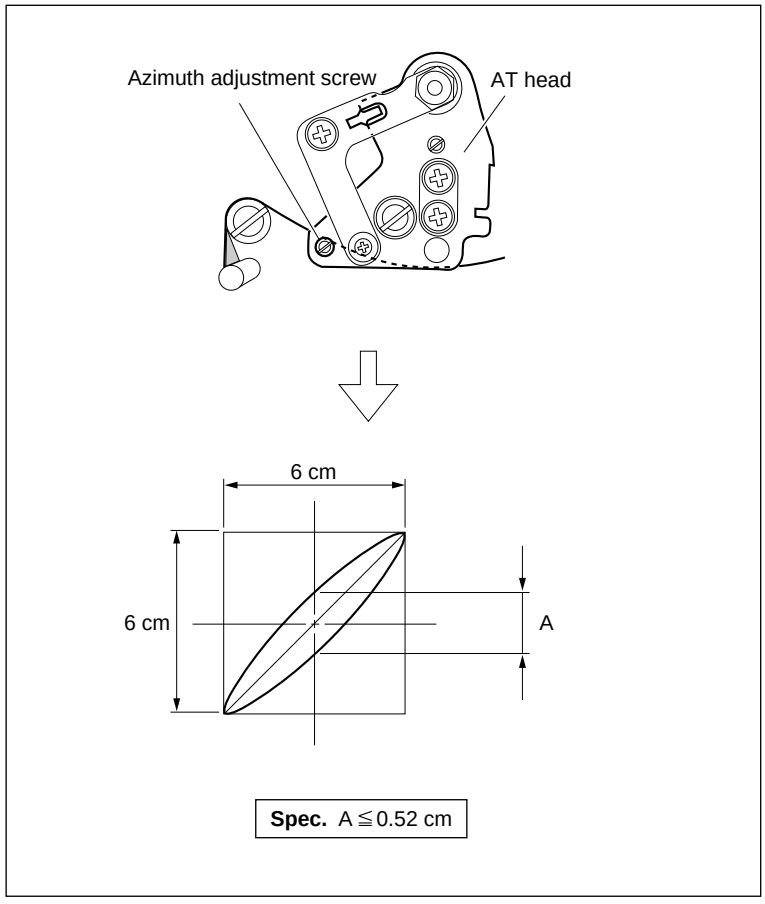


Spec. : A ≦ 0.52 cm

Adjustment

8. Adjust the AT head azimuth

Turn the azimuth adjustment screw so that the specification is satisfied.



After above Adjustments

9. Adjust the AT head head-to-tape contact

(Refer to Section 7-11.)

10. Adjust the AT head position

(Refer to Section 7-8.)

11. Check the AT head height

(Refer to Section 7-9.)

12. Check the AT head azimuth

(Refer to procedures 6 and 7 in this section.)

13. Re-check the AT head

(Rerform the procedures 9, 10 and 11 again.)

14. Locking compound applying

(Refer to Section 7-1-10.)

Note

After adjustment are completed, be sure to set the switch S100-1 back to OFF position.

7-11. AT Head Head-to-tape Contact Check

Tools

- Alignment tape CR8-1A (For analog Betacam, NTSC) : 8-960-097-45
- Alignment tape CR8-1A PS (For analog Betacam, PAL) : 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)
- Wooden skewer

Preparations

1. Turn the power off

2. Connect the oscilloscope

Connect the oscilloscope as follows (See figure on the right side.);
CH-1 : TP800/PA-218 board
Ground at E800
CH-2 : TP801/PA-218 board
Ground at E801
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 1 ms/DIV

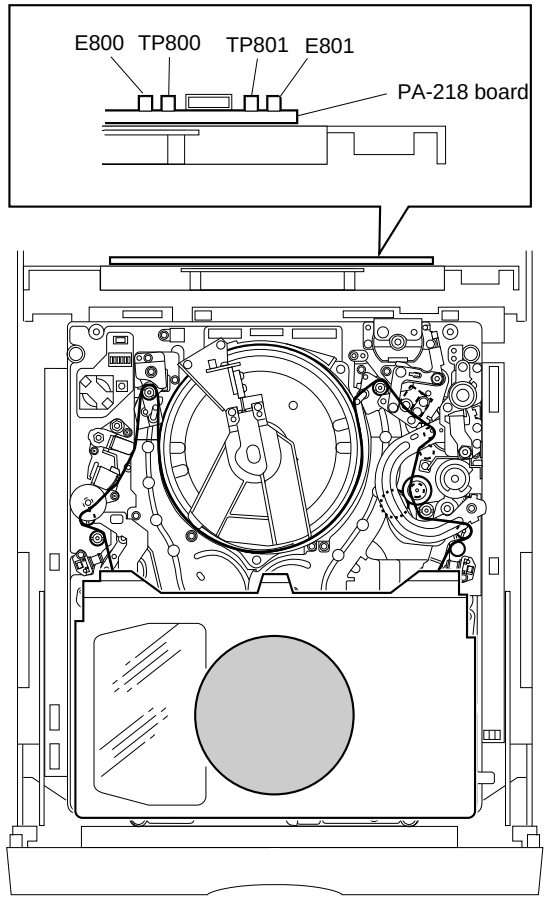
3. Switch setting

Set the switch S100-1 on the SV-194A board to ON. (Refer to Section 7-1-8.)

4. Set the alignment tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
(Weight about 1000 g is suitable.)

- **Connection of the oscilloscope**



Check

5. Turn the power on

6. Play back the alignment tape

Play back the 10 kHz, -10 VU signal portion (3 : 00 to 4 : 55) on the CR8-1A/PS.

7. Check the AT head head-to-tape contact

(1) Push portions A and B of the tape shown in the figure slightly with a wooden skewer. (It means increasing the tape's wrapping angle against the AT head.)

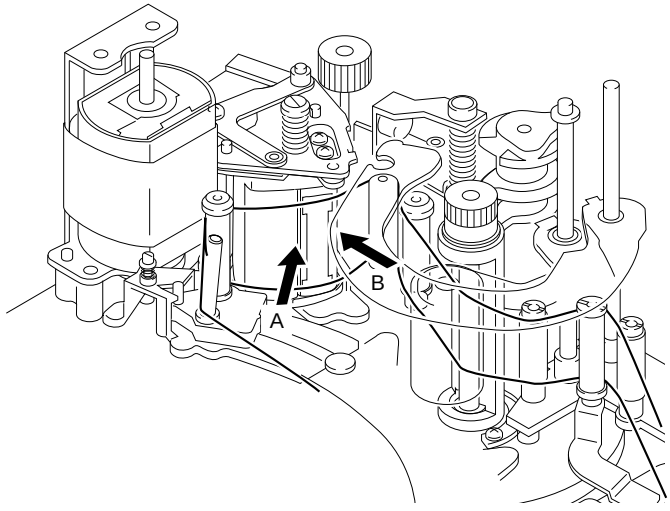
(2) Check that both increasing values of the output levels in CH-1 and CH-2 satisfy the specification.

If the specification is not satisfied, perform the AT head removal and installation again. (Refer to Section 6-15.)

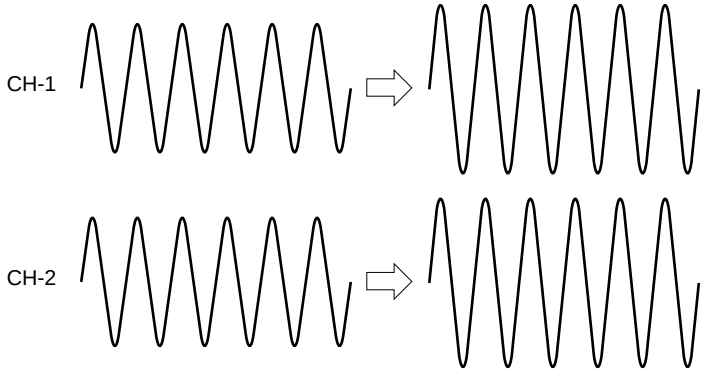
Note

After adjustment are completed, be sure to set the switch S100-1 back to OFF position.

- **Alignment tape : CR8-1A/CR8-1A PS (3 : 00 to 4 : 55)**



<AUDIO output waveform>



Spec. : Both increasing values of the output levels in CH-1 and CH-2 are within 5%.

Section 8
Electrical Alignment after Drum Replacement

8-1. Notes on Electrical Alignment

- Never touch (or turn) the adjustment parts which are not described in Section 8.
  If turned once, the parts require the electrical adjustments that are described in Section 9.
- Do not execute adjustment items nor change data in the maintenance mode which are not described in Section 5.
  If executed or changed carelessly, turn off the power of the DNW-A28/A28P or execute "ALL DATA PREVIOUS" in each NV-RAM control menu so as not to save the data. (Never execute "SAVE ALL ADJUST DATA" in each NV-RAM control menu.)

Note

- A006 : NV RAM CONTROL (in the servo system adjusted data save mode) have no function "ALL DATA REVIOUS."
- For the DNW-A28P, DM-114P board is used instead of the DM-114 board. For convenience in explaining, both DM-114 and DM-114P boards are represented as DM-114 simply.

Equipment and Tools Required

Regarding the measurement equipment and tools used in this section, refer to "1-17-2. Equipment for Adjustment."

Content of Alignment Tapes

Regarding the contents of alignment tapes used in this section, refer to "1-18. Alignment Tape."

Operation of the Maintenance Mode

Entering the maintenance mode

Press S200 (B-1) on the SY-259B board. (For more details, refer to Section 3-1.)

Starting up the Maintenance Mode from Front Panel

The maintenance mode can be started by the operation below when the S201-2 (B-1) switch on the SY-259B board is set to ON (upper).

(1) Press the MENU button once to start up the setup menu.

Note

If menu is not start up, set the "SUPER" of sub menu to "ALL/MENU" and push the MENU button once again. (Regarding the sub menu setting, refer to Section 2 of operation manual.)

(2) Press the SET button while pressing the CTL/TC/U-BIT button.

(3) The mode screen in the maintenance mode is displayed on the video monitor.

Shifting the next menu

(1) Press the JOG dial to enter the JOG mode.

(2) Turn the JOG dial to set the cursor ✻ to the desired menu (or mode).

(3) Press the SET button.

Exiting from the current menu (or mode)

Press the MENU button.

Note

Press the MENU button several times to exit from the maintenance mode.

Saving the data

(1) Turn the JOG dial to set the cursor ∗ to A006 : NV-RAM CONTROL or A1F : NV-RAM CONTROL.
(2) Press the JOG dial or SET button.
(3) Turn the JOG dial to set the cursor ∗ to A006 : “SAVE SERVO ADJUST DATA” or A1F: “SAVE ALL ADJUST DATA.”
(4) Press the SET button.

8-2. Servo/EQ Adjustment after Drum Replacement

Adjustment Items

No.	Item		Adjustment point	Remarks
1	Drum Phase adjustment			
		525/60 system :	A004 : RF SWITCHING POS.	Alignment Tape SR2-1
		Data save	A006 : NV-RAM CONTROL	
		625/50 system :	A004 : RF SWITCHING POS.	Alignment Tape SR2-1P
		Data save	A006 : NV-RAM CONTROL	
2	PB Equalizer adjustment		A11 : EQUALIZER	Alignment Tape SR5-1/SR5-1P
3	REC Current adjustment		A12 : REC CURRENT	Blank Tape
		Data save	A1F : NV-RAM CONTROL	

Preparation

1. Wait 20 minutes or more after turning on the power.
2. Setting of Front Panel
   REC INHI→ OFF

8-2-1. Drum Phase Adjustment

The dram phase adjustment is required for both 525/60 and 625/50 systems.

For 525/60 System

1. Select the 525/60 system for the unit.
   If the 625/50 system is selected, switch the unit to the 525/60 system by setting basic menu ITEM-013 : 525/625 SYSTEM SELECT. Then turn the power off and on again. (for detail, refor to Section 1-19-3.)
2. Prepare the alignment tape SR2-1 which was cued up to 00 : 25 : 00 : 00 of time-code in advance.
3. Press S200 (B-1) on the SY-259B board to enter the maintenance mode.
4. Select M0 : TAPE MAINTENANCE.
5. Select A0 : SERVO ADJUST.
6. Select A00-01 : SERVO ADJUST.
   • An inserted tape will be ejected automatically at the time.
7. Select A004 : RF SWITCHING POS.
8. Select AUTO by shifting the cursor ∗.
9. Press SET button and insert the alignment tape SR2-1. Then ;
   • Automatic drum phase adjustment will be started.
   • After the adjustment is normally completed, the message “ADJUST COMPLETE” will be displayed on the video monitor and the alignment tape will be ejected automatically.
10. Press the MENU button to return to SERVO ADJUST display.
11. Select A006 : NV-RAM CONTROL.
12. Execute “SAVE SERVO ADJUST DATA.”
    • After saving operation is normally completed, the message “DATA SAVED” will be displayed on the video monitor.

For 625/50 System

13. Switch the unit to the 625/50 system by setting basic menu ITEM-013 : 525/625 SYSTEM SELECT referring to the operation manual. Then turn the power off and on again. (For detail, refor to Section 1-19-3.)
14. Prepare the alignment tape SR2-1P which was cued up to 00 : 25 : 00 : 00 of time-code in advance.
15. Press S200 (B-1) on the SY-259B board to enter the maintenance mode.
16. Select M0 : TAPE MAINTENANCE.
17. Select A0 : SERVO ADJUST.
18. Select A00-01 : SERVO ADJUST.
    • An inserted tape will be ejected automatically at the time.
19. Select A004 : RF SWITCHING POS.
20. Select AUTO by shifting the cursor ∗.
21. Press SET button and insert the alignment tape SR2-1P. Then ;
    • Automatic drum phase adjustment will be started.
    • After the adjustment is normally completed, the message “ADJUST COMPLETE” will be displayed on the video monitor and the alignment tape will be ejected automatically.
22. Press the MENU button to return to SERVO ADJUST display.
23. Select A006 : NV-RAM CONTROL.
24. Execute “SAVE SERVO ADJUST DATA.”
    • After saving operation is normally completed, the message “DATA SAVED” will be displayed on the video monitor.
25. For DNW-A28 only
    Return the unit to 525/60 system by setting basic menu ITEM-013 : 525/625 SYSTEM SELECT.

8-2-2. PB Equalizer Adjustment

1. Insert the alignment tape SR5-1 (for DNW-A28) / SR5-1P (for DNW-A28P), then cued up to 00 : 03 : 00 : 00 of time code in advance.
2. Press S200 (B-1) on the SY-259B board to enter the maintenance mode.
3. Select M0 : TAPE MAINTENANCE.
4. Select A1 : RF ADJUST.
5. Select A11 : EQUALIZER.
6. Select ALL by shifting the cursor ∗ in A11 : EQUALIZER menu.
7. Press SET button.
   Then;
   - Automatic PB equalizer adjustment will be started.
   - After the adjustment is normally completed, the message “Auto Adjust Complete” will be displayed on the video monitor.
8. Press the MENU button to return to RF ADJUST MODE display.

Perform Section 8-2-3. “Recording Current Adjustment” following the completion of this adjustment.

8-2-3. Recording Current Adjustment

1. Select A12:REC CURRENT.
2. Select ALL by shifting the cursor ∗ in A12:REC CURRENT menu.
3. Press SET button.
   - An inserted alignment tape will be ejected automatically at the time.
   - The message “Insert Blank Tape” will be displayed on the video monitor.
4. Insert a blank SX tape.
   Then;
   - Automatic recording current adjustment will be started.
   - After the adjustment is normally completed, the message “Auto Adjust Complete” will be displayed on the video monitor.
5. Press the MENU button to return to RF ADJUST MODE display.
6. Select A1F : NV-RAM CONTROL.
7. Execute “SAVE ALL ADJUST DATA.”
   - After saving operation is normally completed, the message “Save Complete” will be displayed on the video monitor.
8. Return to the operation mode by pressing MENU button four times.
9. Eject the blank SX tape.

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8-3. Electrical Adjustment for Analog Video Playback

Adjustment Items

No.	Item		Adjustment point	Remarks
1	Preparation			
2	EQ RF output level adjustment			
		METAL Y	A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP101/DM-114
		METAL C	A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP301/DM-114
		OXIDE C	A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP301/DM-114
		OXIDE Y	A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP101/DM-114
		Saving data	A3F : NV-RAM CONTROL	
3	DM RF output level pre-adjustment			
		METAL Y	⊘RV111/DM-114	TP107/DM-114
		METAL C	⊘RV311/DM-114	TP307/DM-114
		OXIDE C	⊘RV312/DM-114	TP307/DM-114
		OXIDE Y	⊘RV112/DM-114	TP107/DM-114
4	OMC carrier balance adjustment			
		OXIDE Y	⊘RV107/DM-114, ⊘RV108/DM-114	TP111/DM-114
		OXIDE C	⊘RV307/DM-114, ⊘RV308/DM-114	TP309/DM-114
		METAL C	⊘RV305/DM-114, ⊘RV306/DM-114	TP309/DM-114
		METAL Y	⊘RV105/DM-114, ⊘RV106/DM-114	TP111/DM-114
5	OMC carrier balance adjustment (provisional) **Note** This section explains a provisional adjustment for OMC carrier balance without using a spectrum analyzer, as opposed to the adjustment using the spectrum analyzer described above (No.4). Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. Be sure to readjust using the spectrum analyzer at a later date.			
6	Demodulator limiter balance adjustment			
		Y	⊘RV502/DM-114	TP502/DM-114
		C	⊘RV702/DM-114	TP1201/DM-114
7	PB frequency response adjustment			
		METAL Y	A32 : DM VR 1 : EQ1 METAL-Y-A A32 : DM VR 1 : EQ1 METAL-Y-B	SDI OUTPUT (Y CH)
		METAL C	A32 : DM VR 1 : EQ1 METAL-C-A A32 : DM VR 1 : EQ1 METAL-C-B	SDI OUTPUT (R-Y/B-Y CH)
		OXIDE Y	A32 : DM VR 1 : EQ1 OXIDE-Y-A A32 : DM VR 1 : EQ1 OXIDE-Y-B	SDI OUTPUT (Y CH)
		OXIDE C	A32 : DM VR 1 : EQ1 OXIDE-C-A A32 : DM VR 1 : EQ1 OXIDE-C-B	SDI OUTPUT (R-Y/B-Y CH)
		Saving data	A3F : NV-RAM CONTROL	

OMC; Over-Modulation Compensation circuit (Continued)

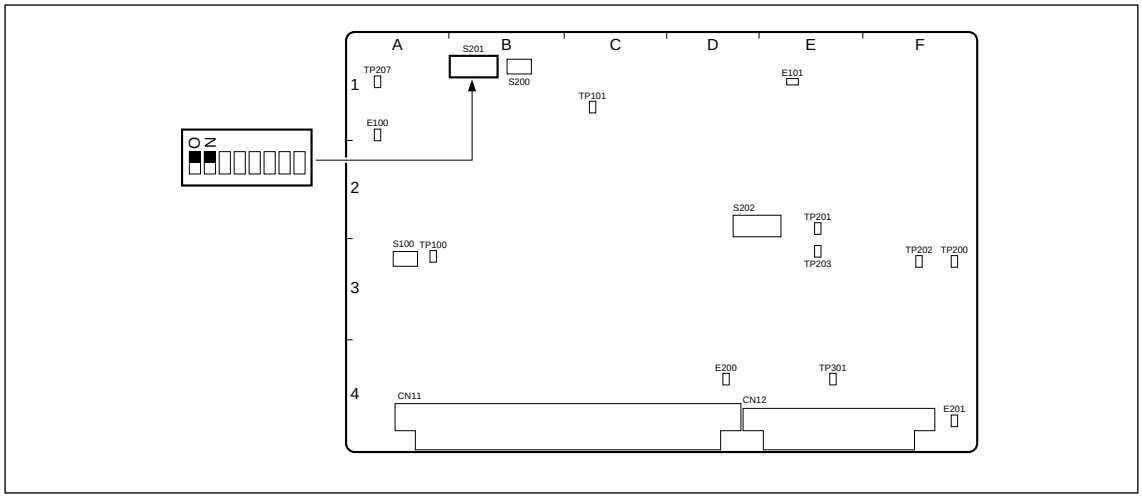
(Continued)

No.	Item	Adjustment point		Remarks
8	DM RF output level adjustment			
		METAL Y	⊘RV111/DM-114	TP107/DM-114
		METAL C	⊘RV311/DM-114	TP307/DM-114
		OXIDE C	⊘RV312/DM-114	TP307/DM-114
		OXIDE Y	⊘RV112/DM-114	TP107/DM-114
9	RF envelope adjustment			
		Y	⊘RV113/DM-114	TP113/DM-114
		C	⊘RV313/DM-114	TP312/DM-114
10	Impact error offset adjustment			
		Y	⊘RV1301/DM-114	Video monitor
		C	⊘RV1501/DM-114	
11	TBC Y/C delay adjustment			
		METAL	⊘RV1601/DM-114 ⊘RV1602/DM-114	SDI OUTPUT
		OXIDE	⊘RV1603/DM-114 ⊘RV1604/DM-114	SDI OUTPUT

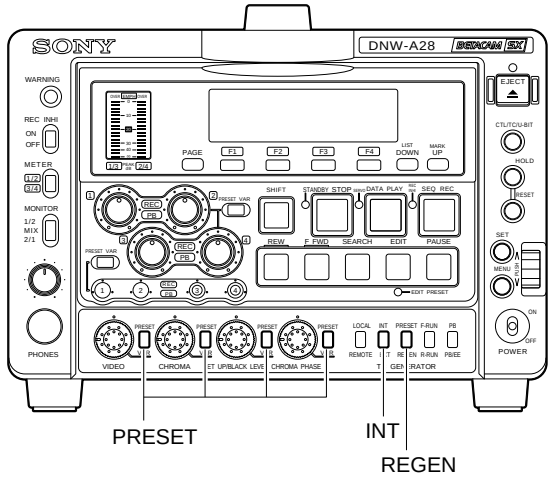
8-3-1. Preparation

Make a photocopy of setting check sheets given in the Appendix A and write down setup conditions in the check sheets.

1. Setting of S201/SY-259B board



2. Setting of Front Panel



3. Video System Setting

(Regarding the video system setting, refer to Section 1-19-3.)

- For DNW-A28, ensure that the unit is set to 525/60 system with the setup menu ITEM-013.
- For DNW-A28P, ensure that the unit is set to 625/50 system with the setup menu ITEM-013.

4. Sub menu Setting

(Regarding the sub menu setting, refer to Section 2 of operation manual.)

- General setting page
  SUPER → ON
- Video setting page
  PROCESS CONTROL → PANEL
  Y/C DLY → 800 PRESET
  SYNC PH → 80
  SC PH → 80

5. Setup menu setting

(Regarding the setup menu setting, refer to Section 6 of operation manual.)

- For DNW-A28
  ITEM-713 : VIDEO SETUP REFERENCE LEVEL
  SUB-ITEM 0 : MASTER LEVEL → 7.5 %
  1 : INPUT LEVEL → MSTER
  2 : INPUT VBLK CNT → THROU
  3 : BETACAM PB LEVEL → MSTER
  4 : OUTPUT LEVEL → MSTER

Note

It may be that “SUB-ITEM 1 : INPUT LEVEL” and “SUB-ITEM 2 : INPUT VBLK CNT” will not display.

- For DNW-A28P
  No setting required

6. Time data display setting

Press the CTL/TC/U-BIT button to indicate TC on the display.

Entering the maintenance mode

Enter the maintenance mode in the following way, A or B.

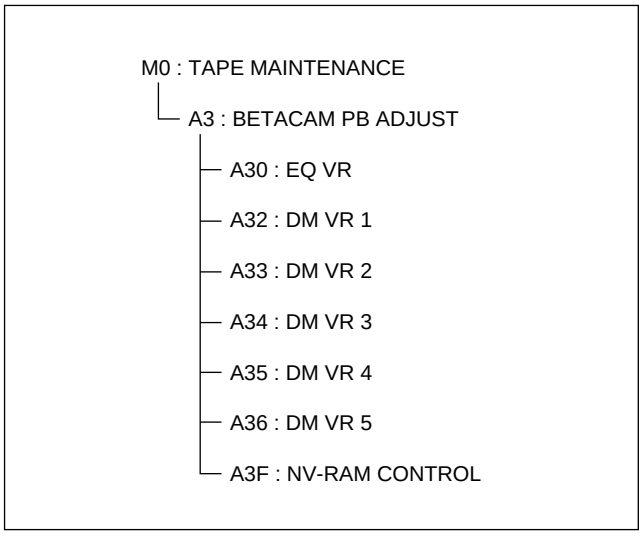
A : Press the MENU button to enter the setup menu when the S201-2 (B-1) switch on the SY-259B board is set to ON (upper).
Press the SET button while pushing the CTL/TC/U-BIT button to start up the maintenance mode.

B : Press S200 (B-1) on SY-259B board to enter the maintenance mode.

Notes

The operation of the maintenance mode is described as follows.

The sub mode and menus of the maintenance mode that are used in this section are shown below.



• Shifting to the next menu

(1) Press the JOG dial to enter the JOG mode.
(2) Turn the JOG dial to set the cursor ∗ to the desired menu (or mode).
(3) Press the SET button.

• Exiting from the current menu (mode)

(1) Press the MENU button.

Note

Press the MENU button several times to exit from the maintenance mode.

• Changing the data value

(1) Turn the JOG dial to set the cursor ∗ to the item to be changed.
(2) Press and Turn the JOG dial slowly. = **Data value changes.**

Up word direction : the data value decreases (FF follows 00)
Down word direction : the data value increases (00 follows FF)

Note

During adjustment, change the rotational direction of the JOG dial observing the change of waveform that is displayed on the measuring equipment.

• Saving the data

(1) Turn the JOG dial to set the cursor ∗ to A3F : NV-RAM CONTROL.
(2) Press the SET button once.
(3) Turn the JOG dial to set the cursor ∗ to “SAVE ALL ADJUST DATA.”
(4) Press the SET button once.

• Tape operations (play back, rewind, fast-forward, etc.) in the maintenance mode

(1) Enter any of menu A30 to A36.
(2) To pause the maintenance mode operation, press the SET button. = **It enables tape operation.**

Note

The display of the time data display area on the FL display panel is changed to the time code display in the normal operation mode. And the ■ mark is displayed at the top right corner of menu screen on the monitor.

(3) After the tape operation is completed, press the MENU button to cancel the pause of maintenance mode.

Note

The displays of the time data display area and monitor are returned to their previous states.

8-3-2. EQ RF Output Level Adjustment

Note

Allow about a minute after the alignment tape (Betacam SP cassette) is inserted.

Measuring equipment : Oscilloscope
(20 MHz BW LIMIT : ON)

Preparation/Setting

1. Select A30 : EQ VR of the maintenance mode.
2. Connect and set the oscilloscope as follows:
   CH-1 : TP112/DM-114 (∗N-4), DC 1 V/DIV
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP101/DM-114 (∗P-4), AC 100 mV/DIV, 2 ms/DIV
   GND : E101/DM-114 (∗P-4)
   Trigger : CH-1

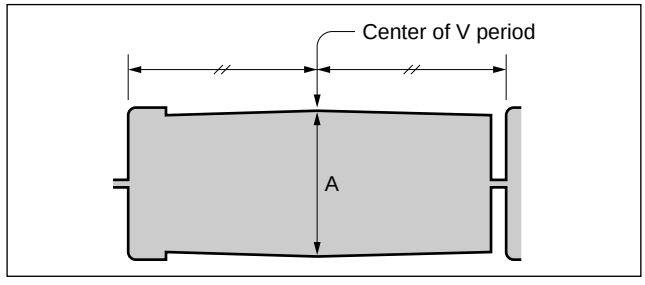
1. METAL Y adjustment

1. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS. Press the MENU button and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

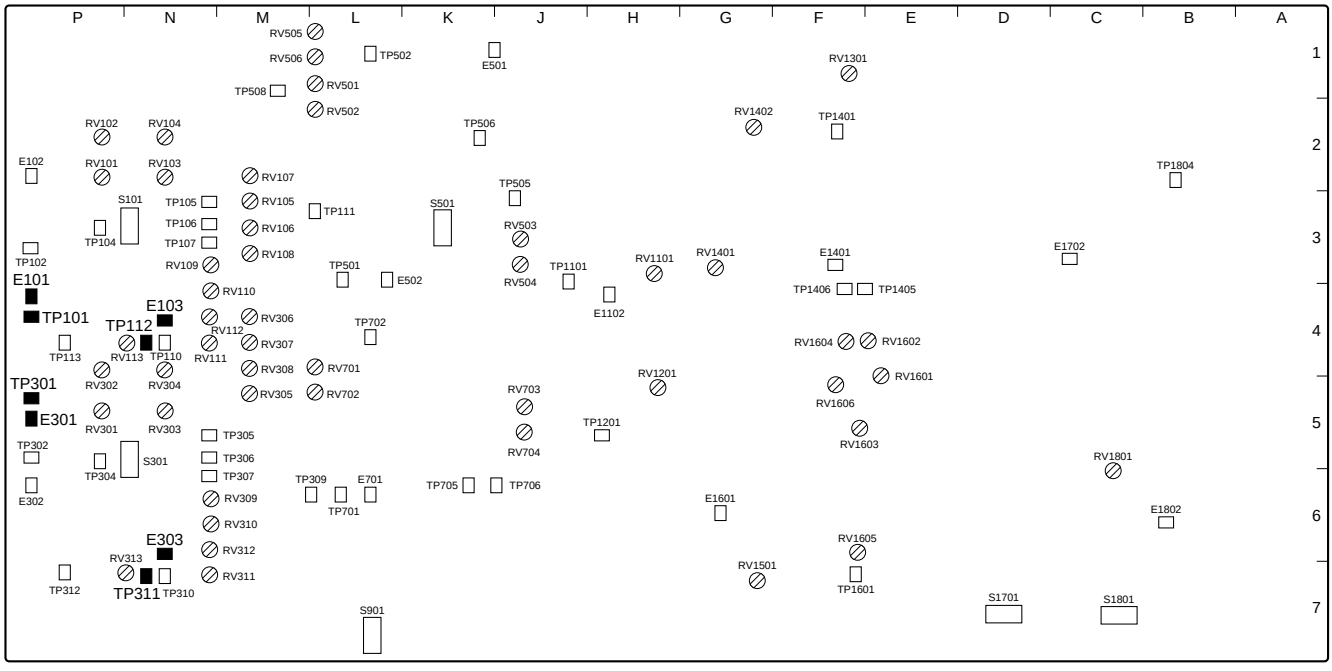
Notes

Adjust respectively for Y-A and Y-B channels.
Observing the Y-A channel, set the trigger of oscilloscope to the negative (−) slope.
Observing the Y-B channel, set the trigger of oscilloscope to the positive (+) slope.

Adjustment points :
Y-A channel : A30 : EQ VR : RF GAIN METAL-Y-A
Y-B channel : A30 : EQ VR : RF GAIN METAL-Y-B
Specifications (Y-A and Y-B channels) :
A = 380 ±20 mV p-p



2. Press the SET button and stop the playback of the alignment tape.



DM-114 Board (B Side)

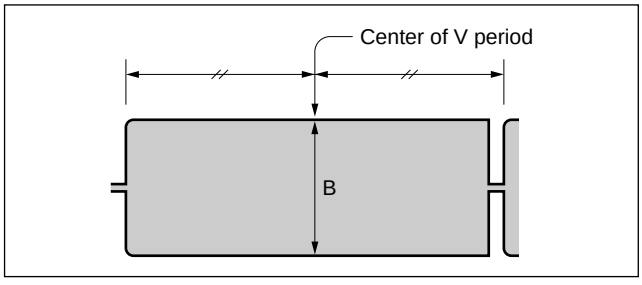
2. METAL C adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1 : TP311/DM-114 (∗N-7)
   GND : E303/DM-114 (∗N-6)
   CH-2 : TP301/DM-114 (∗P-5)
   GND : E301/DM-114 (∗P-5)
   Trigger : CH-1
2. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS.
   Press the MENU button and perform the adjustment.
   (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

   Notes

   Adjust respectively for C-A and C-B channels.
   Observing the C-A channel, set the trigger of oscilloscope to the negative (−) slope.
   Observing the C-B channel, set the trigger of oscilloscope to the positive (+) slope.

   Adjustment points :
   C-A channel : A30 : EQ VR : RF GAIN METAL-C-A
   C-B channel : A30 : EQ VR : RF GAIN METAL-C-B
   Specifications (C-A and C-B channels) :
   B = 380 ± 20 mV p-p



3. Press the SET button and eject the alignment tape.

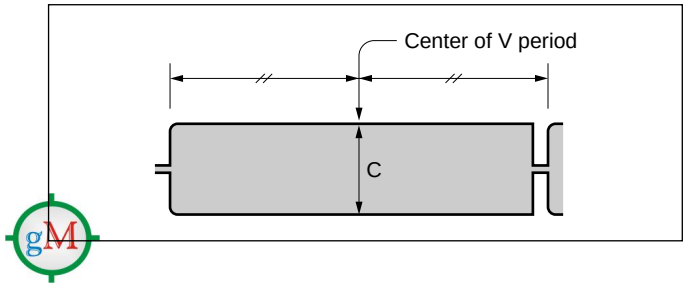
3. OXIDE C adjustment

1. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS.
   Press the SET button and perform the adjustment.
   (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)

   Notes

   Adjust respectively for C-A and C-B channels.
   Observing the C-A channel, set the trigger of oscilloscope to the negative (−) slope.
   Observing the C-B channel, set the trigger of oscilloscope to the positive (+) slope.

   Adjustment points :
   C-A channel : A30 : EQ VR : RF GAIN OXIDE-C-A
   C-B channel : A30 : EQ VR : RF GAIN OXIDE-C-B
   Specifications (C-A and C-B channels):
   C = 250 ± 20 mV p-p



2. Press the SET button and stop the playback of the alignment tape.

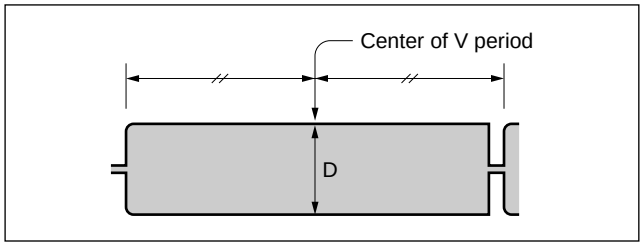
4. OXIDE Y adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1 : TP112/DM-114 (∗N-4)
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP101/DM-114 (∗P-4)
   GND : E101/DM-114 (∗P-4)
   Trigger : CH-1
2. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS. Press the SET button and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)

   Notes

   Adjust respectively for Y-A and Y-B channels.
   Observing the Y-A channel, set the trigger of oscilloscope to the negative (−) slope.
   Observing the Y-B channel, set the trigger of oscilloscope to the positive (+) slope.

   Adjustment points :
   Y-A channel : A30 : EQ VR : RF GAIN OXIDE-Y-A
   Y-B channel : A30 : EQ VR : RF GAIN OXIDE-Y-B
   Specifications (Y-A and Y-B channels) :
   D = 250 ±20 mV p-p



3. Press the SET button and eject the alignment tape CR5-2A/CR5-2A PS.
4. To exit from A30 : EQ VR, press the MENU button on the control panel twice.

5. Saving data

1. Select A3F : NV-RAM CONTROL of the maintenance mode, then execute “SAVE ALL ADJUST DATA.”
2. Check that the message “Save Complete” is displayed on the video monitor.
3. To exit from A3F : NV-RAM CONTROL, press the MENU button once.
4. To exit the maintenance mode, press the MENU button three times.

8-3-3. DM RF Output Level Pre-adjustment

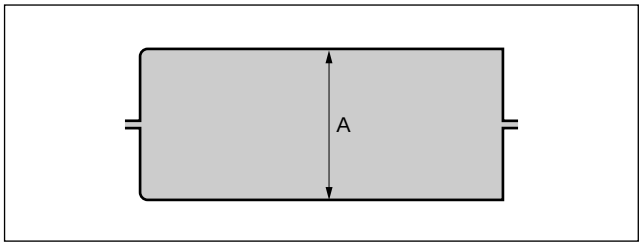
Measuring equipment : Oscilloscope
(20 MHz LIMIT : ON)

Preparation/Setting

1. Connect and set the oscilloscope as follows:
   CH-1 : TP112/DM-114 (∗N-4), DC 1 V/DIV
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP107/DM-114 (∗N-3), AC 100 mV/DIV, 2 ms/DIV
   GND : E103/DM-114 (∗N-4)
   Trigger : CH-1, negative (−) slope

1. METAL Y adjustment

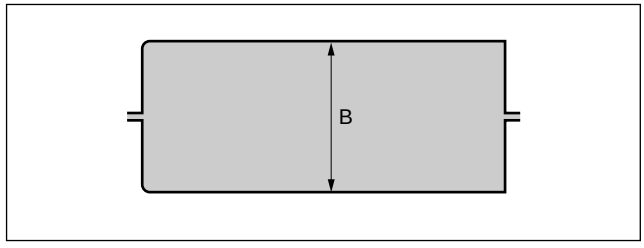
1. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV111/DM-114 (∗N-4)
   Specification : A = 400 ±40 mV p-p



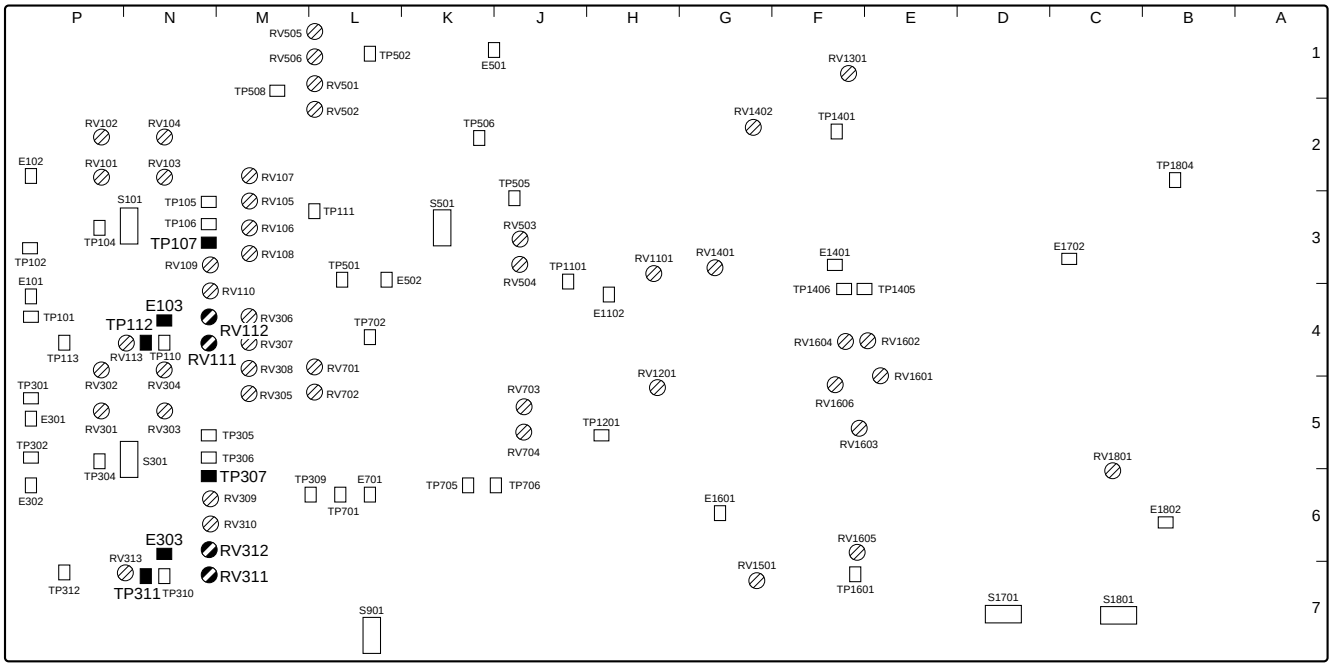
2. Stop the playback of the alignment tape.

2. METAL C adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP311/DM-114 (∗N-7)
   GND : E303/DM-114 (∗N-6)
   CH-2 : TP307/DM-114 (∗N-6)
   GND : E303/DM-114 (∗N-6)
2. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV311/DM-114 (∗N-7)
   Specification : B = 400 ±40 mV p-p



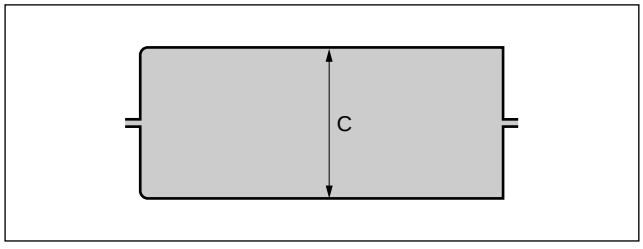
3. Eject the alignment tape.



DM-114 Board (B Side)

3. OXIDE C adjustment

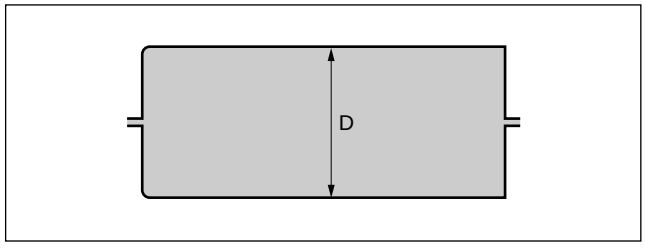
1. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment point : ⊘RV312/DM-114 (⁎N-6)
   Specification : C = 400 ± 40 mV p-p



2. Stop the playback of the alignment tape.

4. OXIDE Y adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1 : TP112/DM-114 (⁎N-4)
   GND : E103/DM-114 (⁎N-4)
   CH-2 : TP107/DM-114 (⁎N-3)
   GND : E103/DM-114 (⁎N-4)
2. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment point : ⊘RV112/DM-114 (⁎N-4)
   Specification : D = 400 ± 40 mV p-p



3. Stop the playback of the alignment tape.

8-3-4. OMC Carrier Balance Adjustment

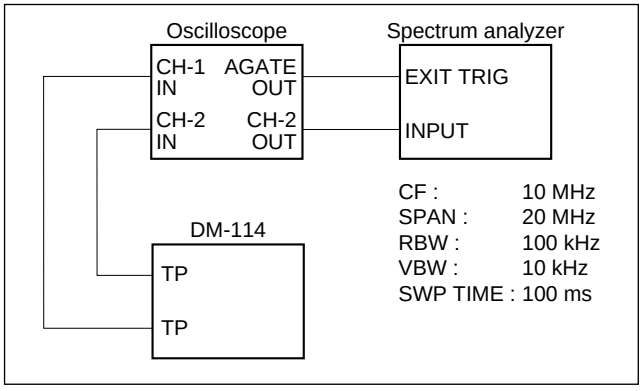
Note

If a spectrum analyzer is not available, refer to Section 8-3-5.

Measuring equipment :

Spectrum analyzer and Oscilloscope (Show below for connection.)

Preparation/Setting

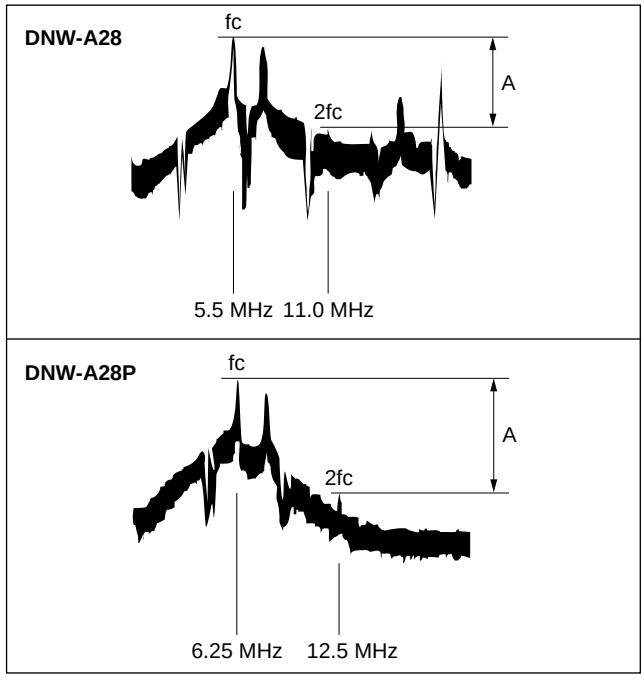


Connection and Setting of Spectrum Analyzer

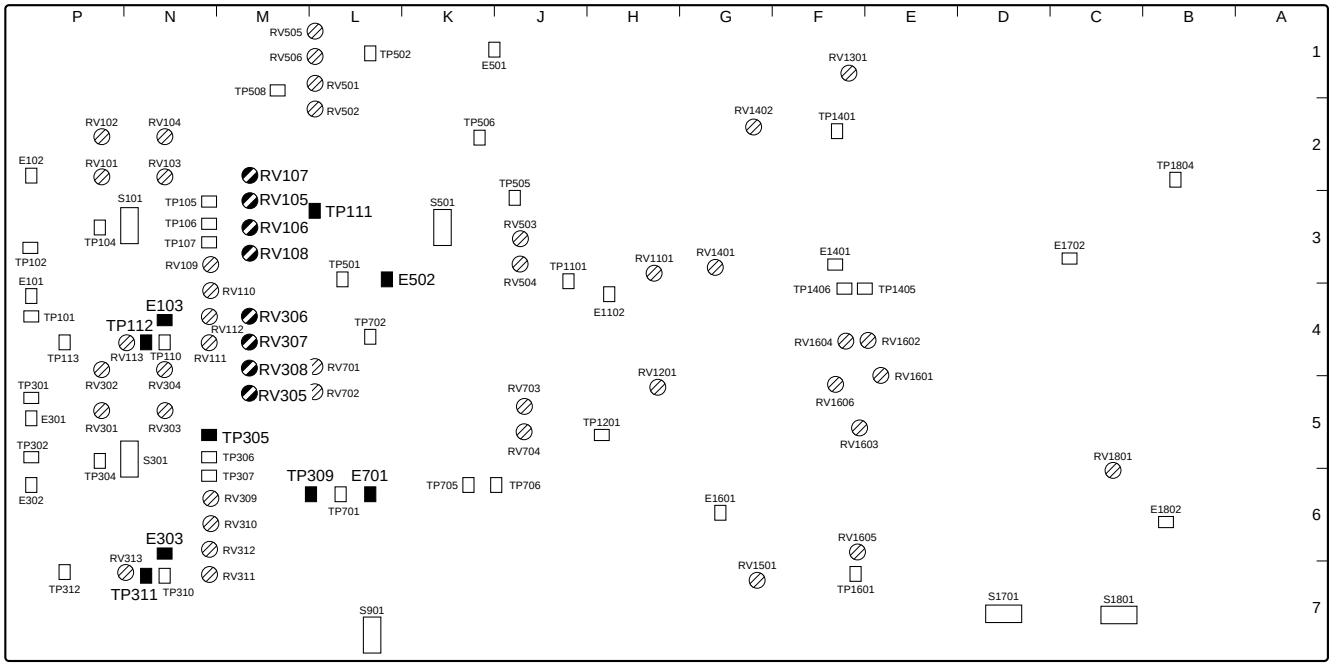
1. Connect and set the oscilloscope as follows:
   CH-1 : TP112/DM-114 (∗N-4), DC 1 V/DIV
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP111/DM-114 (∗L-3), AC 1 V/DIV, 5 ms/DIV
   GND : E502/DM-114 (∗L-3)
   Trigger : CH-1, negative (−) slope

1. OXIDE Y adjustment

1. Play back the pulse & bar signal portion (9 : 00 to 11 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment points : ⊘RV107/DM-114 (∗M-2) and ⊘RV108/DM-114 (∗M-3)
   Specification : A ≧ 35 dB



2. Stop the playback of the alignment tape.



DM-114 Board (B Side)

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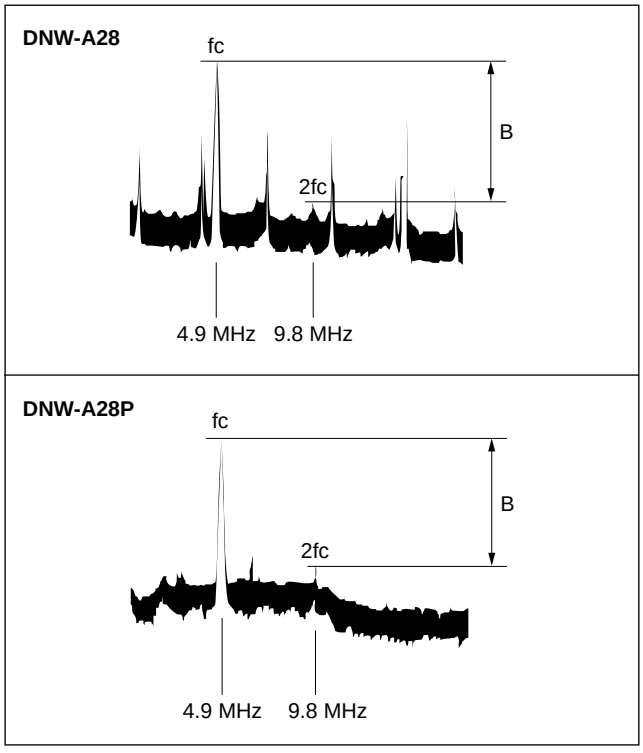
2. OXIDE C adjustment

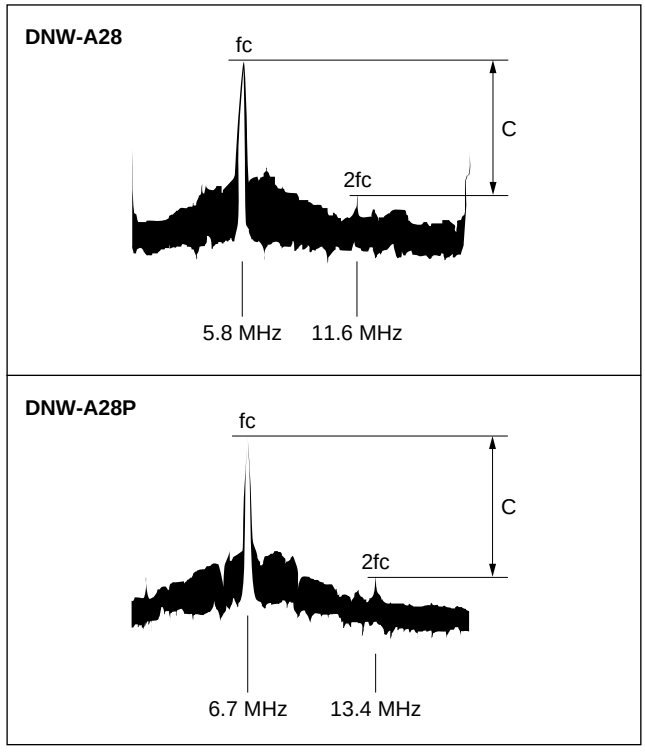
1. Change the connection of the oscilloscope as follows:
   CH-1 : TP311/DM-114 (∗N-7)
   GND : E303/DM-114 (∗N-6)
   CH-2 : TP309/DM-114 (C-4)
   GND : E701/DM-114 (∗L-6)
2. Play back the pulse & bar signal portion (9 : 00 to 11 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment points : ⊘RV307/DM-114 (∗M-4) and ⊘RV308/DM-114 (∗M-4)
   Specification : B ≧ 35 dB



3. Eject the alignment tape.

3. METAL C adjustment

1. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment points : ⊘RV305/DM-114 (∗M-5) and ⊘RV306/DM-114 (∗M-4)
   Specification : C ≧ 40 dB

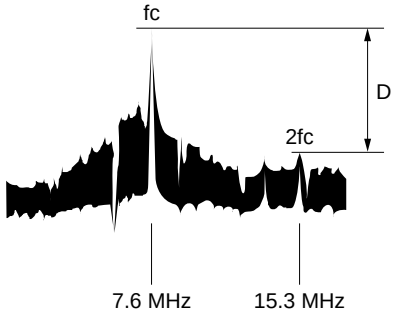


2. Stop the playback of the alignment tape.

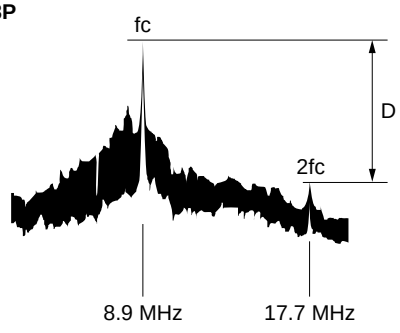
4. METAL Y adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP112/DM-114 (⁎N-4)
   GND : E103/DM-114 (⁎N-4)
   CH-2 : TP111/DM-114 (⁎L-3)
   GND : E502/DM-114 (⁎L-3)
2. Play back the flat filed signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment pointss : ⊘RV105/DM-114 (⁎M-3) and ⊘RV106/DM-114 (⁎M-3)
   Specification : D ≧ 40 dB

DNW-A28



DNW-A28P



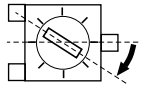
3. Stop the playback of the alignment tape.

8-3-5. OMC Carrier Balance Adjustment (Provisional)

Notes

- This section explains a provisional adjustment for OMC carrier balance without using a spectrum analyzer. If Section 8-3-4. “OMC Carrier Balance Adjustment” is completed, this adjustment is not required.
- Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. At a later date, be sure to readjust using the spectrum analyzer referring to Section 8-3-4.

Set the following RVs on DM-114 board to specified position respectively.



RV105 (⁎M-3)
RV106 (⁎M-3)
RV107 (⁎M-2)
RV108 (⁎M-3)
RV305 (⁎M-5)
RV306 (⁎M-4)

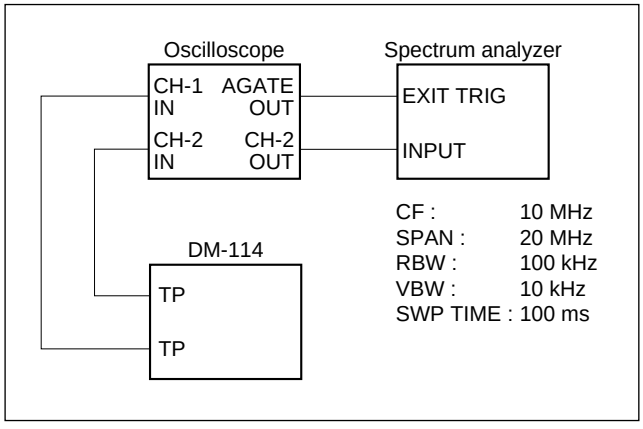
8-3-6. Demodulator Limiter Balance Adjustment

Measuring equipment :

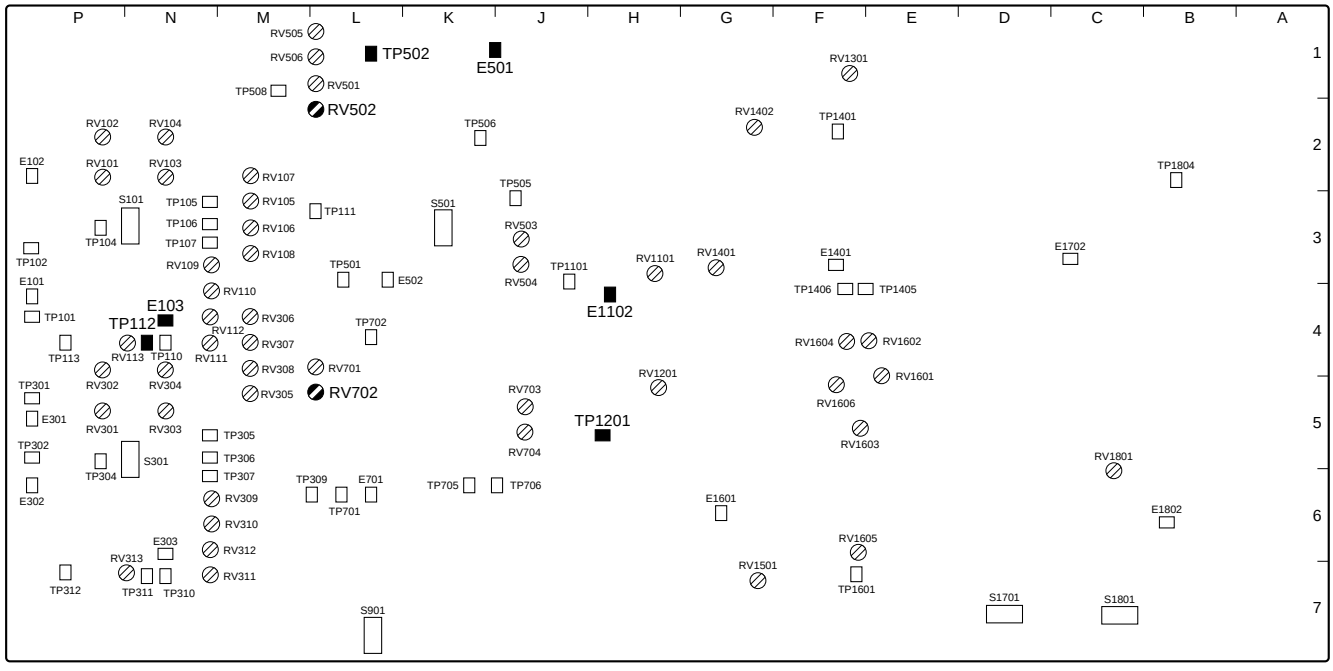
Spectrum analyzer and Oscilloscope (Show below for connection.)

Note

As for the Y adjustment, the provisional adjustment described below is allowed only when the spectrum analyzer is not available for an urgent maintenance. If the provisional adjustment is performed, be sure to readjust the Y signal using the spectrum analyzer at a later date.



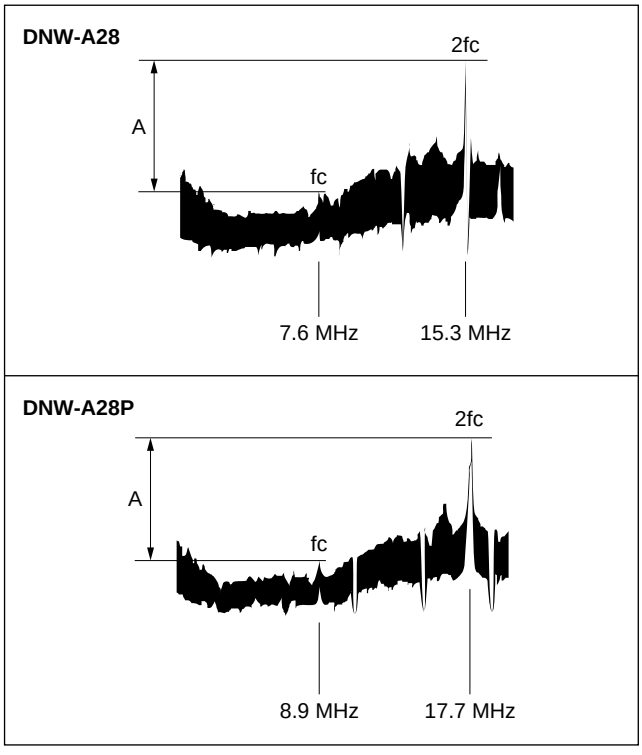
Connection and Setting of Spectrum Analyzer



DM-114 Board (B Side)

1. Y adjustment (using the spectrum analyzer)

1. Connect and set the oscilloscope as follows :
   CH-1 : TP112/DM-114 (⁎N-4), DC 1 V/DIV
   GND : E103/DM-114 (⁎N-4)
   CH-2 : TP502/DM-114 (⁎L-1), AC 1 V/DIV, 5 ms/DIV
   GND : E501/DM-114 (⁎J-1)
   Trigger : CH-1, negative (−) slope
2. Play back the flat filed signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ⊘RV502/DM-114 (⁎L-2)
   Specification : Maximize the level difference A. (Minimize the fc.)



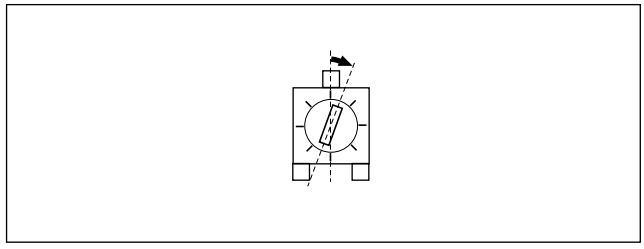
3. Stop the playback of the alignment tape.

2. Provisional Y adjustment (without using the spectrum analyzer)

Note

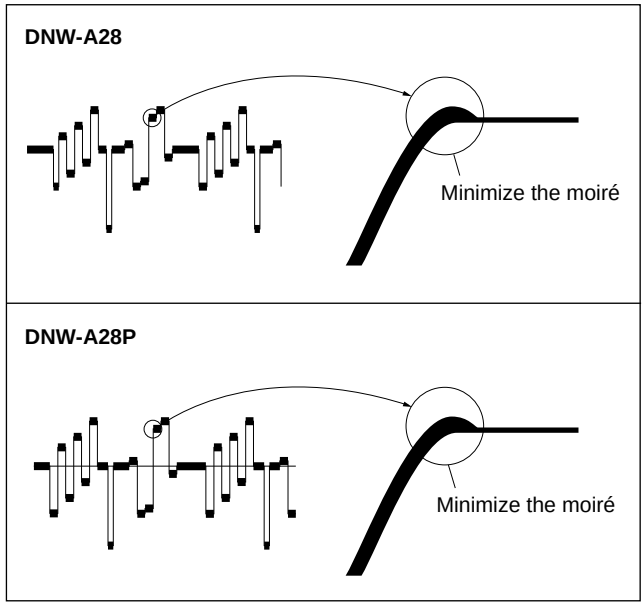
This section explains the provisional adjustment for Y signal without using a spectrum analyzer. If the above-mentioned Y adjustment is completed, this adjustment is not required.

Set RV502/DM-114 (⁎L-2) as shows below.



3. C adjustment

1. Connect and set the oscilloscope as follows:
   CH-2 : TP1201/DM-114 (⁎H-5), AC 200 mV/DIV
   GND : E1102/DM-114 (⁎H-4)
   TIME : 10 μs/DIV
   Trigger : CH-2
2. Play back the color-bar signal portion (14 : 00 to 17 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ⊘RV702/DM-114 (⁎L-5)
   Specification : Minimize the moiré of specified part.



3. Stop the playback of the alignment tape.

8-3-7. PB Frequency Response Adjustment

Measuring equipment : Digital component waveform monitor

Preparation/Setting

1. Connect the digital component waveform monitor to the SDI OUT connector.
2. Select A32 : DM VR 1 of the maintenance mode.
3. Press the SET button.

1. METAL Y adjustment

1. Observe the Y output signal on the component waveform monitor.
2. Play back the multiburst signal portion (8 : 00 to 11 : 00) of the alignment tape CR5-1B or CR5-1B PS. Press the SET button and adjust so that the level at 4.1 MHz (or 5 MHz for PAL) portion is within specification. And confirm that levels at other frequencies are within specifications.
   (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

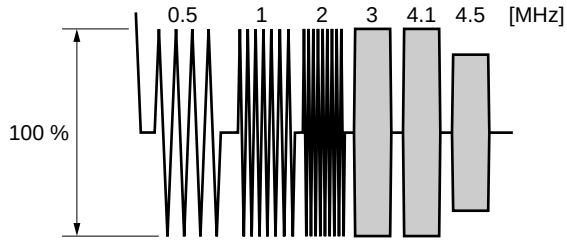
   Note

   The overlapping waveform of A channel and B channel signals is monitored on the component waveform monitor. So adjust/confirm the signal level at each channel.

   Adjustment points :
   A channel : A32 : DM VR 1 : EQ1 METAL-Y-A
   B channel : A32 : DM VR 1 : EQ1 METAL-Y-B
   Specifications (A and B channels) :
   See the table below.

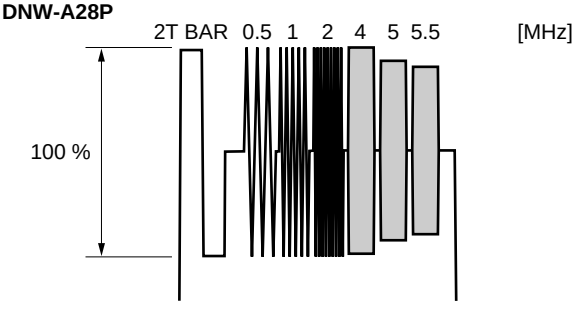
Frequency	Specifications for DNW-A28	
0.5 MHz	Reference : 100 % {0 dB}	
4.1 MHz	Adjust : 94 (100 to 90) %	{$-0.5\ ^{+0.5}_{-0.4}$ dB}
1 MHz	Check : 100 (106 to 63) %	{$0\ ^{+0.5}_{-4.0}$ dB}
2 MHz	Check : 100 (106 to 63) %	{$0\ ^{+0.5}_{-4.0}$ dB}
3 MHz	Check : 100 (106 to 63) %	{$0\ ^{+0.5}_{-4.0}$ dB}
4.5 MHz	Check : 80 (106 to 63) %	{$-2.0\ ^{+2.5}_{-2.0}$ dB}

DNW-A28



Frequency	Specifications for DNW-A28P	
2T BAR	Reference : 100 % {0 dB}	
5 MHz	Adjust : 91 (96 to 87) %	{-0.8 ± 0.4 dB}
0.5 MHz	Check : 100 (106 to 63) %	{$0\ ^{+0.5}_{-4.0}$ dB}
1 MHz	Check : 100 (106 to 63) %	{$0\ ^{+0.5}_{-4.0}$ dB}
2 MHz	Check : 100 (106 to 63) %	{$0\ ^{+0.5}_{-4.0}$ dB}
4 MHz	Check : 100 (106 to 63) %	{$0\ ^{+0.5}_{-4.0}$ dB}
5.5 MHz	Check : 84 (106 to 63) %	{$-1.5\ ^{+2.0}_{-2.5}$ dB}

DNW-A28P



3. Connect the video monitor to VIDEO OUTPUT 1 connector.
4. Press the SET button and play back the multiburst signal portion (8 : 00 to 11 : 00) of the alignment tape CR5-1B or CR5-1B PS. Check that the playback picture on the video monitor has no flicker.
   (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
5. Reconnect the video monitor to VIDEO OUTPUT 2 (SUPER) connector.

2. METAL C adjustment

1. Observe the R-Y output signal on the component waveform monitor.
2. Play back the multiburst signal portion (8 : 00 to 11 : 00) of the alignment tape CR5-1B or CR5-1B PS. Press the MENU button and adjust so that the level at 1 MHz (or 1.5 MHz for PAL) portion is within specification. And confirm that levels at other frequencies are within specifications.
   (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

   Note

   The overlapping waveform of A channel and B channel signals is monitored on the component waveform monitor. So adjust/confirm the signal level at each channel.

   Adjustment points :

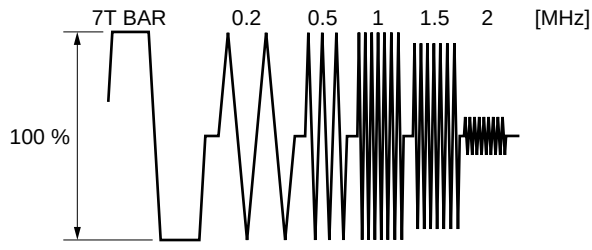
   A channel : A32 : DM VR 1 : EQ1 METAL-C-A
   B channel : A32 : DM VR 1 : EQ1 METAL-C-B

   Specifications (A and B channels) :

   See the table below.

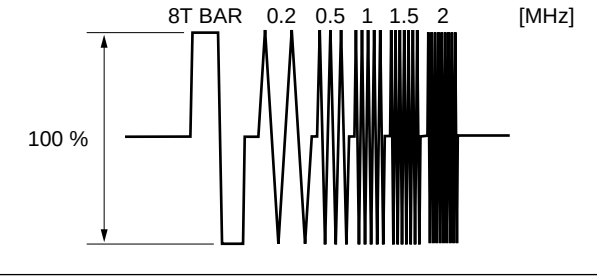
Frequency	Specifications for DNW-A28	
7T BAR	Reference : 100 % {0 dB}	
1 MHz	Adjust : 94 (100 to 89) %	{−0.5 ±0.5 dB}
0.2 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check : 80 (106 to 71) %	{−2.0 $^{+2.5}_{-1.0}$ dB}

DNW-A28



Frequency	Specifications for DNW-A28P	
8T BAR	Reference : 100 % {0 dB}	
1.5 MHz	Adjust : 93 (102 to 85) %	{−0.6 ±0.8 dB}
0.2 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
1 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
2 MHz	Check : 80 (106 to 71) %	{−2.0 $^{+2.5}_{-1.0}$ dB}

DNW-A28P



3. Observe the B-Y output signal on the component waveform monitor. Confirm the B-Y signal levels at every frequencies are within specifications shown above. If the B-Y signal is out of specifications, perform fine adjustment for R-Y until the specifications for both B-Y and R-Y signals are satisfied.
4. Press the SET button and eject the alignment tape.

3. OXIDE Y adjustment

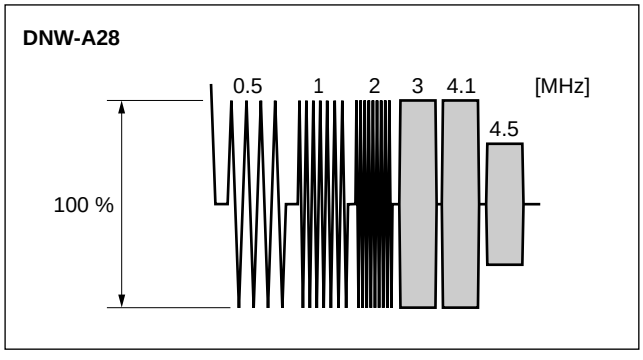
1. Observe the Y output signal on the component waveform monitor.
2. Play back the multiburst signal portion (3 : 00 to 6 : 00) of the alignment tape CR5-2A or CR5-2A PS. Press the SET button and adjust so that the level at 2 MHz (or 3 MHz for PAL) portion is within specification. And confirm that levels at other frequencies are within specifications.
   (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)

   Note

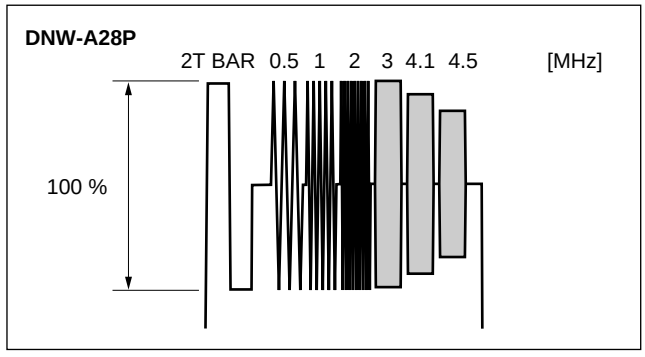
   The overlapping waveform of A channel and B channel signals is monitored on the component waveform monitor. So adjust/confirm the signal level at each channel.

   Adjustment points :
   A channel : A32 : DM VR 1 : EQ1 OXIDE-Y-A
   B channel : A32 : DM VR 1 : EQ1 OXIDE-Y-B
   Specifications (A and B channels) :
   See the table below.

Frequency	Specifications for DNW-A28
0.5 MHz	Reference : 100 % {0 dB}
2 MHz	Adjust : 100 (104 to 95) % {0 $^{+0.3}_{-0.4}$ dB}
1 MHz	Check : 100 (106 to 50) % {0 $^{+0.5}_{-6.0}$ dB}
3 MHz	Check : 89 (106 to 50) % {−1.0 $^{+1.5}_{-5.0}$ dB}
4.1 MHz	Check : 71 (106 to 50) % {−3.0 $^{+3.5}_{-3.0}$ dB}



Frequency	Specifications for DNW-A28P
2T BAR	Reference : 100 % {0 dB}
3 MHz	Adjust : 89 (100 to 79) % {−1.0 ± 1.0 dB}
0.5 MHz	Check : 100 (106 to 50) % {0 $^{+0.5}_{-6.0}$ dB}
1 MHz	Check : 100 (106 to 50) % {0 $^{+0.5}_{-6.0}$ dB}
2 MHz	Check : 100 (106 to 50) % {0 $^{+0.5}_{-6.0}$ dB}
4.1 MHz	Check : 71 (106 to 50) % {−3.0 $^{+3.5}_{-3.0}$ dB}



3. Press the SET button and play back the multiburst signal portion (3 : 00 to 6 : 00) of the alignment tape CR5-2A or CR5-2A PS, and confirm that the level difference between the A and B channel signals is hardly noticeable at high frequency portion (4.5 MHz).

   Note

   If the level difference is noticeable at 4.5 MHz, adjustment using menu A34 : DM VR3 : SUB OXIDE-A or -B is required. Following steps ① to ⑦, adjust the channel with the lower level while playing back the multiburst signal portion (3 : 00 to 6 : 00) of the alignment tape.

- Low level channel's adjustment procedures
  ① To exit from A32 : DM VR 1, press the MENU button once.
  ② Select A34 : DM VR 3 of the maintenance mode.
  ③ Change the data value of SUB OXIDE-Y-A (A channel side), and judge which signal is lower in level. (DNW-A28 : BC, DNW-A28P : C9)
  ④ If the B channel signal is lower, return the data value of SUB OXIDE-Y-A to the former data, then adjust the SUB OXIDE-Y-B so as to increase the value until the level of B channel signal is almost equal to the level of A channel signal. If the A channel signal is lower, adjust the SUB OXIDE-Y-A so as to increase the value until the level of A channel signal is almost equal to level of B channel signal.
  ⑤ To exit from A34 : DM VR 3, press the MENU button once.
  ⑥ Select A32 : DM VR 1.
  ⑦ To perform the tape operation, press the SET button once.

4. OXIDE C adjustment

1. Observe the R-Y output signal on the component waveform monitor.
2. Play back the multiburst signal portion (3 : 00 to 6 : 00) of the alignment tape CR5-2A or CR5-2A PS, and adjust so that the level at 1 MHz portion is within specification. And confirm that levels at other frequencies are within specifications. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)

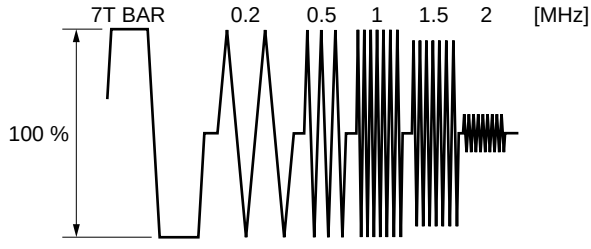
Note

The overlapping waveform of A channel and B channel signals is monitored on the component waveform monitor. So adjust/confirm the signal level at each channel.

Adjustment points :
A channel : A32 : DM VR 1 : EQ1 OXIDE-C-A
B channel : A32 : DM VR 1 : EQ1 OXIDE-C-B
Specifications (A and B channels) :
See the table below.

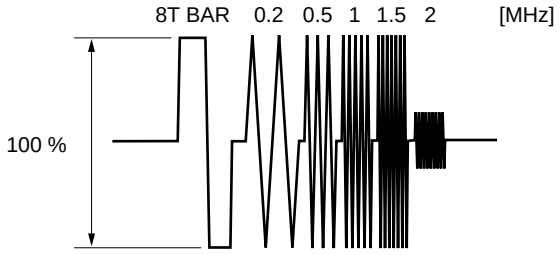
Frequency	Specifications for DNW-A28	
7T BAR	Reference : 100 % {0 dB}	
1 MHz	Adjust : 94 (100 to 89) %	{–0.5 ±0.5 dB}
0.2 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check : 95 (106 to 71) %	{–0.4 $^{+0.9}_{-2.6}$ dB}
1.5 MHz	Check : 80 (106 to 71) %	{–2.0 $^{+2.5}_{-1.0}$ dB}

DNW-A28



Frequency	Specifications for DNW-A28P
8T BAR	Reference : 100 % {0 dB}
1 MHz	Adjust : 94 (102 to 86) % {−0.5 ±0.8 dB}
0.2 MHz	Check : 100 (106 to 71) % {0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check : 100 (106 to 71) % {0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check : 84 (106 to 71) % {−1.5 $^{+2.0}_{-1.5}$ dB}

DNW-A28P



3. Observe the B-Y output signal on the component waveform monitor. Confirm the B-Y signal levels at every frequencies are within specifications shown above. If the B-Y signal is out of specifications, perform fine adjustment for R-Y until the specifications for both B-Y and R-Y signals are satisfied.
4. Eject the alignment tape.
5. To exit from A32 : DM VR 1, press the MENU button once.

5. Saving data

1. Select A3F : NV-RAM CONTROL of the maintenance mode, and execute “SAVE ALL ADJUST DATA”.
2. Check that the message “Save Complete” is displayed on the video monitor.
3. To exit from A3F : NV-RAM CONTROL, press the MENU button once.
4. To exit the maintenance mode, press the MENU button three times.

8-3-8. DM RF Output Level Adjustment

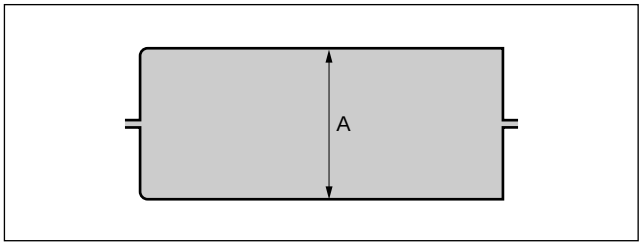
Measuring equipment : Oscilloscope
(20 MHz BW LIMIT : ON)

Preparation/Setting

1. Connect and set the oscilloscope as follows :
   CH-1 : TP112/DM-114 (∗N-4), DC 1 V/DIV
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP107/DM-114 (∗N-3), AC 100 mV/DIV
   GND : E103/DM-114 (∗N-4)
   TIME : 2 ms/DIV
   Trigger : CH-1, negative (−) slope

1. METAL Y adjustment

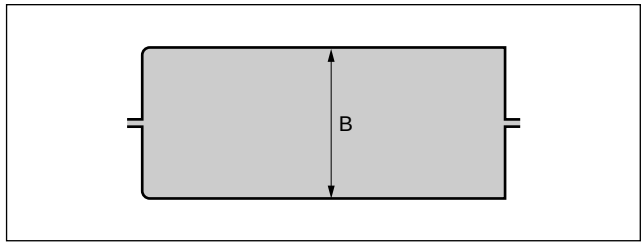
1. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV111/DM-114 (∗N-4)
   Specification : A = 400 ±40 mV p-p



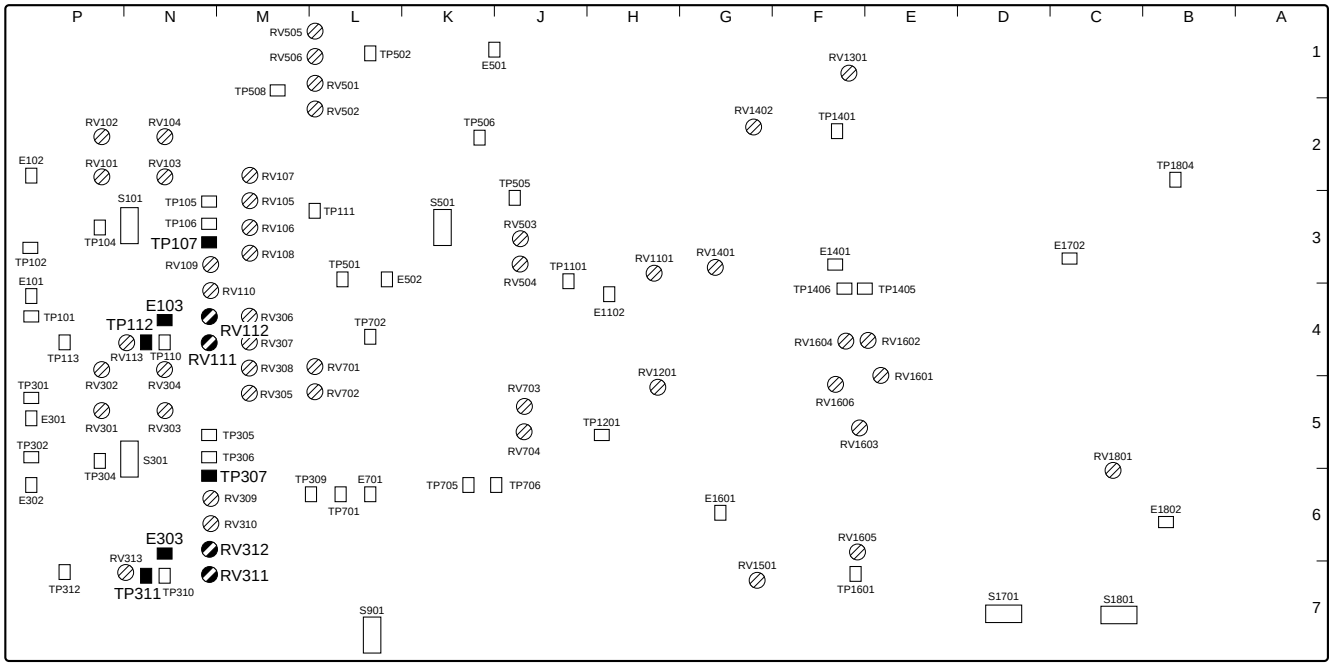
2. Stop the playback of the alignment tape.

2. METAL C adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1 : TP311/DM-114 (∗N-7)
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP307/DM-114 (C-1)
   GND : E103/DM-114 (∗N-4)
2. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV311/DM-114 (∗N-7)
   Specification : B = 400 ±40 mV p-p



3. Eject the alignment tape.

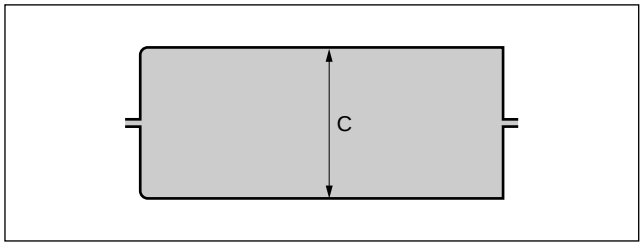


DM-114 Board (B Side)

http://getMANUAL.com

3. OXIDE C adjustment

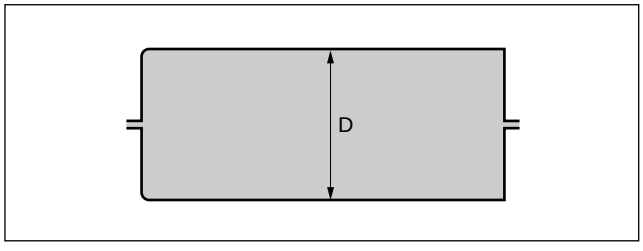
1. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment point : ⊘RV312/DM-114 (⁎N-6)
   Specification : C = 400 ± 40 mV p-p



2. Stop the playback of the alignment tape.

4. OXIDE Y adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP112/DM-114 (⁎N-4)
   GND : E103/DM-114 (⁎N-4)
   CH-2 : TP107/DM-114 (⁎N-3)
   GND : E103/DM-114 (⁎N-4)
2. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment point : ⊘RV112/DM-114 (⁎N-4)
   Specification : D = 400 ± 40 mV p-p



3. Eject the alignment tape.

8-3-9. RF Envelope Adjustment

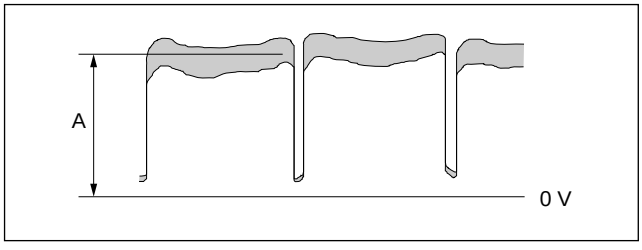
Measuring equipment : Oscilloscope

Preparation/Setting

1. Connect and set the oscilloscope as follows:
   CH-1 : TP112/DM-114 (∗N-4), DC 1 V/DIV
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP113/DM-114 (∗P-4), DC 500 mV/DIV
   GND : E103/DM-114 (∗N-4)
   TIME : 5 ms/DIV
   Trigger : CH-1, negative (−) slope

1. Y adjustment

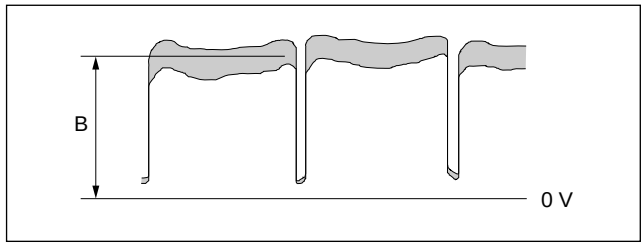
1. Play back the flat filed signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV113/DM-114 (∗N-4)
   Specification : A = 2.0 ±0.2 V dc



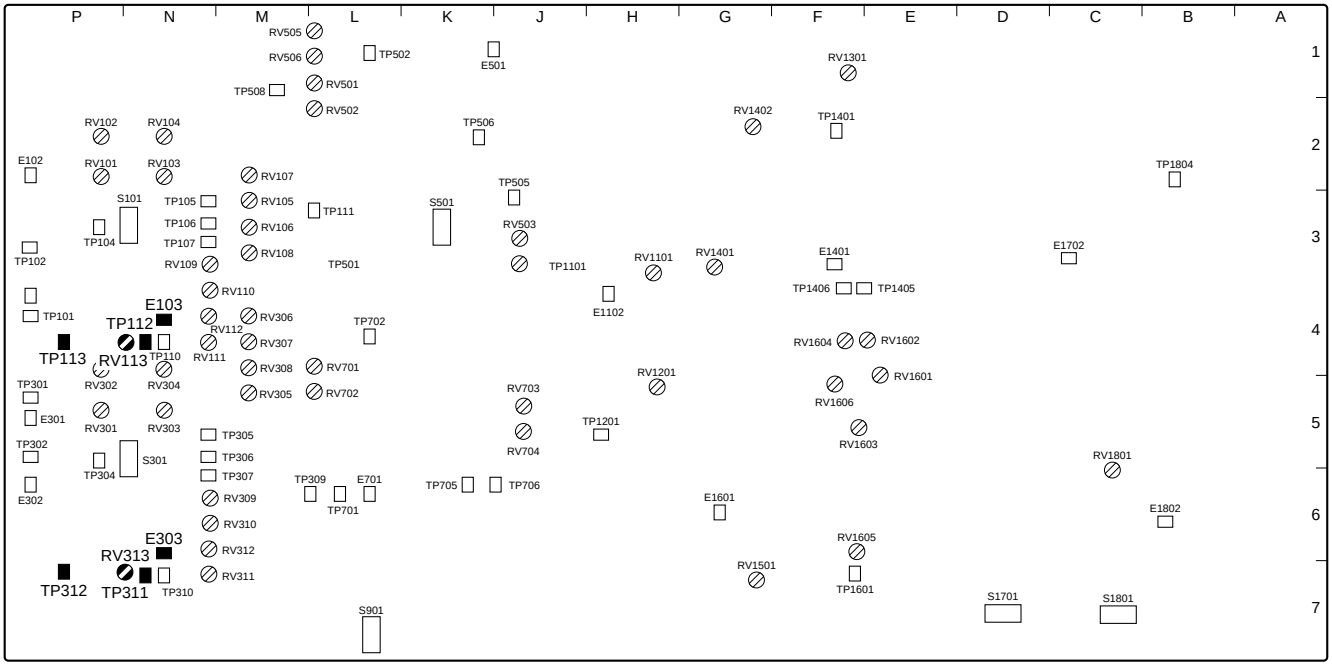
2. Stop the playback of the alignment tape.

2. C adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP311/DM-114 (∗N-7)
   GND : E303/DM-114 (∗N-6)
   CH-2 : TP312/DM-114 (∗P-7)
   GND : E303/DM-114 (∗N-6)
2. Play back the flat filed signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV313/DM-114 (∗N-7)
   Specification : B = 2.0 ±0.2 V dc



3. Stop the playback of the alignment tape.

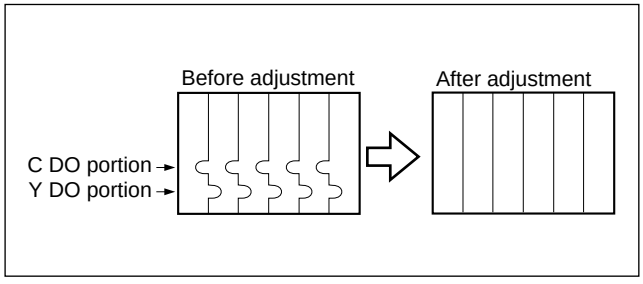


DM-114 Board (B Side)

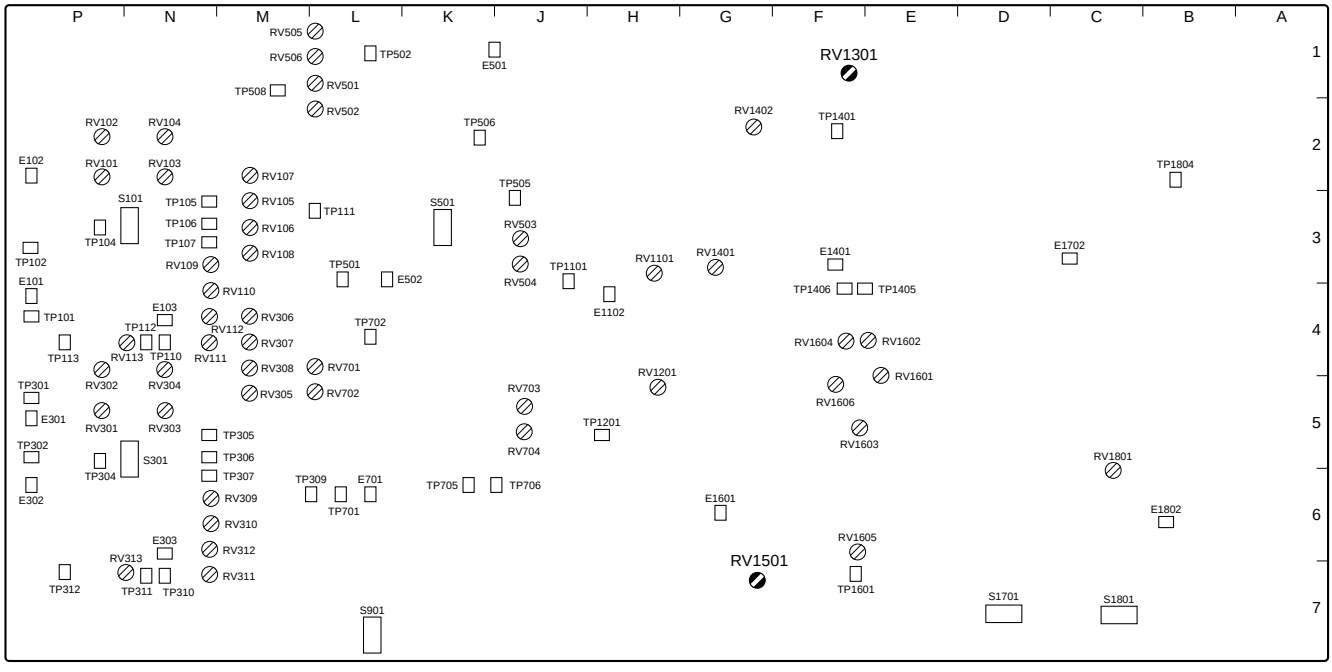
8-3-10. Impact Error Offset Adjustment

Measuring equipment : Video monitor

1. Play back the color-bar signal portion (26 : 00 to 28 : 00) of the alignment tape CR5-1B or CR5-1B PS. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
2. Adjust the following RVs until the drop-out portions (Y DO and C DO) of color-bar displayed on the video monitor disappear.
   Adjustment points : Y DO : ⊘RV1301/DM-114 (∗F-1)
   C DO : ⊘RV1501/DM-114 (∗G-7)
   Specification : See the figure below.



3. Stop the playback of the alignment tape.



DM-114 Board (B Side)

8-3-11. TBC Y/C Delay Adjustment

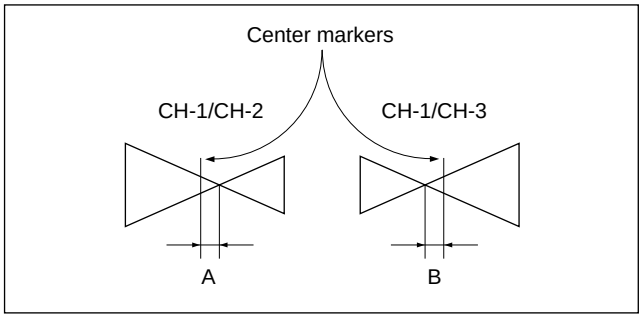
Measuring equipments : Digital Component waveform monitor

Preparation/Setting

1. Put the component waveform monitor into BOWTIE mode.

1. METAL adjustment

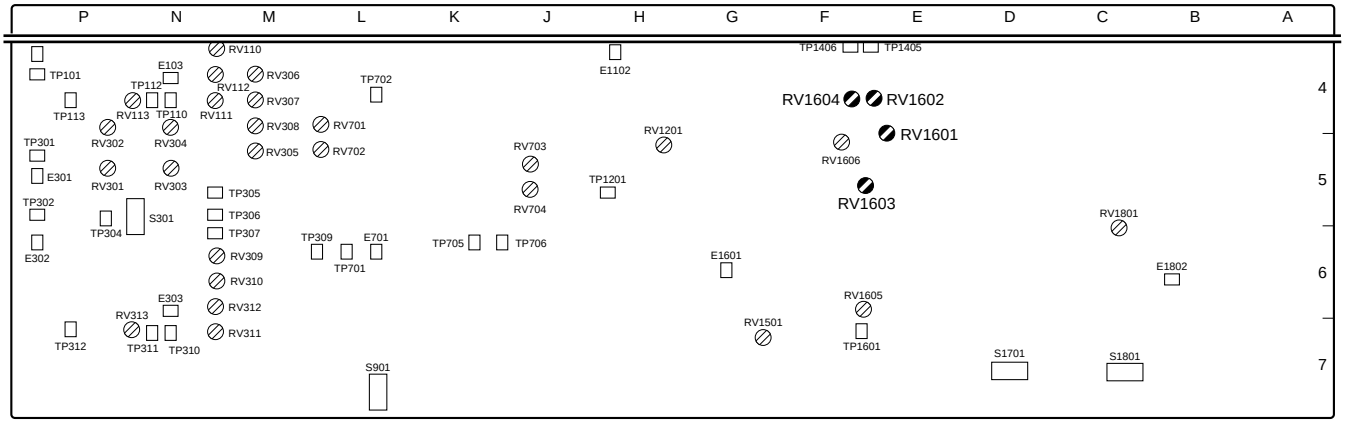
1. Play back the bowtie signal portion (17 : 00 to 19 : 00) of the alignment tape CR5-1B or CR5-1B PS. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
2. Observe the bowtie dip point at which the CH-1 (Y) and CH-2 (B-Y) signals cross. Adjust so that the deviation between the center marker and bowtie dip point is within specification. Then observe the point at which the CH-1 (Y) and CH-3 (R-Y) signals cross and adjust in the same manner.
   Adjustment points : Field 1 : ⊘RV1601/DM-114 (∗E-4)
   Field 2 : ⊘RV1602/DM-114 (∗E-4)
   Specifications : A = 0 ±10 ns
   B = 0 ±10 ns



3. Eject the alignment tape.

2. OXIDE adjustment

1. Play back the bowtie signal portion (6 : 00 to 9 : 00) of the alignment tape CR5-2A or CR5-2A PS. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
2. Observe the bowtie dip point at which the CH-1 (Y) and CH-2 (B-Y) signals cross. Adjust so that the deviation between the center marker and bowtie dip point is within specification. Then observe the point at which the CH-1 (Y) and CH-3 (R-Y) signals cross and adjust in the same manner.
   Adjustment point : ⊘RV1603/DM-114 (∗F-5)
   ⊘RV1604/DM-114 (∗F-4)
   Specifications : A = 0 ±10 ns
   B = 0 ±10 ns
3. Eject the alignment tape.



DM-114 Board (B Side)

Section 9
Electrical Alignment

9-1. General Information for Electrical Alignment

9-1-1. Notes on Electrical Alignment

- Do not execute adjustment items nor change data in the maintenance mode which are not described in Section 9.
  If executed or changed carelessly, turn off the power of the DNW or execute “ALL DATA PREVIOUS” in each NV-RAM control menu so as not to save the data. (Never execute “SAVE ALL ADJUST DATA” in each NV-RAM control menu.)

Notes

- A006 : NV RAM CONTROL (in the servo system adjusted data save mode) have no function “ALL DATA REVIOUS.”
- For details on the maintenance mode, refer to Section 3 “Maintenance Mode.”
- Before beginning adjustment, it is recommended to make a photocopy of check sheets given in the Appendix A and write down setup conditions such as switches' setting in the check sheets.
  If setup conditions are noted, the settings can be returned easily to its original condition after finishing adjustment.
- For the DNW-A28P, DM-114P board is used instead of the DM-114 board. For convenience in explaining, both DM-114 and DM-114P boards are represented as DM-114 simply.

Equipment and Tools Required

For the measurement equipment and tools used in this section, refer to “1-17-2. Equipment for Adjustment.”

Contents of Alignment Tapes

For the contents of alignment tapes used in this section, refer to “1-18. Alignment Tape.”

Operation of the Maintenance Mode

Entering the maintenance mode

Press S200 (B-1) on the SY-259B board. (For more details, refer to Section 3-1.)

Starting up the Maintenance Mode from Front Panel

The maintenance mode can be started by the operation below when the S201-2 (B-1) switch on the SY-259B board is set to ON (upper).

(1) Press the MENU button once to start up the setup menu.

Note

If menu is not start up, set the “SUPER” of sub menu to “ALL/MENU” and push the MENU button once again. (Regarding the sub menu setting, refer to Section 2 of operation manual.)

(2) Press the SET button while pressing the CTL/TC/U-BIT button.
(3) The mode screen in the maintenance mode is displayed on the video monitor.

Shifting the next menu

(1) Press the JOG dial to enter the JOG mode.
(2) Turn the JOG dial to set the cursor ∗ to the desired menu (or mode).
(3) Press the SET button.

Exiting from the current menu (or mode)

Press the MENU button.

Note

Press the MENU button several times to exit from the maintenance mode.

Saving the data

(1) Turn the JOG dial to set the cursor ∗ to A006 : NV-RAM CONTROL or A1F : NV-RAM CONTROL.
(2) Press the JOG dial or SET button.
(3) Turn the JOG dial to set the cursor ∗ to A006 : “SAVE SERVO ADJUST DATA” or A1F : “SAVE ALL ADJUST DATA.”
(4) Press the SET button.

9-1-2. Outline

Adjustment items necessary at board replacement or maintenance are grouped under the following blocks in Section 6. Included among them is how to adjust using the maintenance menu, variable resistors and so on.
As for adjustments using the maintenance menu, items requiring measuring equipment and the way of manual adjustment are also explained.

Block	Board name	Reference	Service action
System control	SY-259B	Section 9-2	Setting required in replacing SY-259B board
Servo	SV-194A	Section 9-3	Electrical adjustment required in replacing SV-194A board
SDI	SDI-23	Section 9-4	Manual adjustment for SDI VCO
RF	EQ-72	Section 9-5	Electrical adjustment required in replacing EQ-72 board
Audio	AU-249/CP-344/PA-218	Section 9-6	Overall for audio system adjustment
Reference signal/ Video processing	TG-191/VPR-34	Section 9-7	Reference signal / Analog composite video output adjustment
Composite decoder	DEC-97	Section 9-8	Analog composite video input adjustment
Analog Betacam PB	DM-114	Section 9-9	Overall adjustment for analog Betacam play back system
Timecode	SV-194A	Section 9-10	

9-1-3. Setting and Adjustment after Board Replacement

Board name	Section	Setting and adjustment after replacement
SY-259B	9-2	Setup menu respecification Error logger clear Calendar/clock setting Serial No. setting (M31 : SERIAL NUMBER)
SV-194A	9-3 9-10	Maintenance mode A0 : SERVO ADJUST execution Time code system adjustment (Also applied during AT head replacement.)
SDI-23	9-4	Maintenance mode A23 : SDIVR execution Data saving A1F : NV-RAM CONTROL execution
EQ-72	9-5	Maintenance mode A17 : A11-A16 ALL ADJUST execution Data saving A1F : NV-RAM CONTROL execution Maintenance mode A30 : EQ VR execution Data saving A3F : NV-RAM CONTROL execution
AU-249	9-6	Audio system overall adjustment
PA-218	9-6	Audio system overall adjustment
TG-191	9-7	Maintenance mode A20 : VPR/TG VR execution Data saving A2F : NV-RAM CONTROL execution
VPR-34	9-7	Maintenance mode A20 : VPR/TG VR execution Data saving A2F : NV-RAM CONTROL execution
DEC-97	9-8	Maintenance mode A25 : DEC VR A26 : DEC VR (LOOP) A24 : INPUT OF DETECT execution Data saving A2F : NV-RAM CONTROL execution
DM-114	9-9	Maintenance mode A30 : EQ VR (EQ RF output level adjustment) A33 : DM VR2 (Cosine equalizer adjustment) A34 : DM VR3 A35 : DM VR4 execution Data saving A3F : NV-RAM CONTROL execution

9-2. System control

9-2-1. SY-259B board Replacement

Check/Setting Required Before Replacement

- Checking the setting state of the setup menus (Basic menu and extended menu for 525/60 and 625/50 line systems)
  Make a photocopy of check sheets given in the Appendix A and write down setup conditions in the check sheets.
- Setting DIP switch
  Set the DIP switch S202 (D-2) of a new SY-259B board according to the type of the unit. For details, refer to the Section 1-8.

Settings Required After Replacement

- Resetting the setup menus (Basic menu and extended menu for 525/60 and 625/50 line systems)
  Reset the setup menu according to the filled-in check sheets.
- Clearing the error logs/Setting the calendar and clock
  Be sure to refresh a NV-RAM on a replaced SY-259B board, because there is a fear that the NV-RAM stores an unnecessary error logs.
  Calendar and clock are used to show the time and date when error occurs. Adjust the calendar/clock correctly because they may be wrong. For details, refer to Section 3-3.
- Serial Number Setting
  Since a serial number data is stored up in a NV-RAM on the SY-259B board, be sure to reset the serial number when the SY-259B board or RV-RAM (IC112) has been replaced. For more details, refer to Section 3-4-3.

9-3. Servo System

9-3-1. Servo System Adjustment

After replacing the SV-194A board, be sure to perform adjustments for the following all items. If the NV-RAM (IC403/SV-194A) is replaced, perform steps 1 and 2.

1. Turn on the power while pressing the switch S101 (⁎B-1) on the SV-194A board to initialize the servo adjustment data, and release the switch S101 after three seconds.
   Note
   If the system error ERROR-97 (SV NV-RAM ERROR) occurs at this time, turn off the power and vetry.

2. Make adjustments automatically for all items of the maintenance mode A0 : SERVO ADJUST and save their data. For details on operation, refer to Section 3-2-6.
   A000 : A001-A003 ADJ.
   (A001 : S REEL FG DUTY)
   (A002 : CAPSTAN FG DUTY)
   (A003 : CAPSTAN FRICTION)
   A004 : CAPSTAN FREE SPEED
   A005 : RF SWITCHING POS.
   A006 : NV-RAM CONTROL
3. Perform the LTC erasure current adjustment. For details, refer to Section 9-10-1.

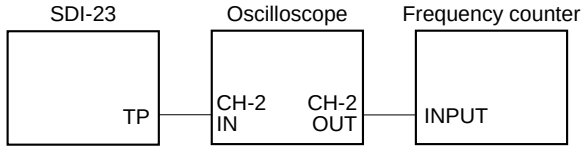
9-4. SDI

After replacing the SDI-23 board or replacing the EE-PROM (IC457), SDI DEC (IC102), SDI ENC (IC702) or their peripheral parts on the SDI-23 board, make adjustments automatically for items of the maintenance mode A23 : SDI VR. Allow ten minutes to begin the adjustment after the unit is powered on.
And it is possible to adjust the SDI VCO in the manual mode. To adjust in the manual mode, proceed as follows.

9-4-1. SDI VCO Adjustment in Manual Mode

Equipment : Frequency counter and Oscilloscope

1. Ten minutes are allowed to begin adjustment
2. Activate the maintenance menu.
3. Select the item which you want.
   A231 : SDI ENC VCO
   A232 : SDI DEC VCO
4. Select Manual.
5. Test Points :
   TP700/SDI-23 (F-1) for A231 : SDI ENC VCO
   TP200/SDI-23 (F-1) for A232 : SDI DEC VCO



6. Turn the JOG dial until the specification is satisfied.
   Specification : 27.00 ±0.05 MHz

7. Select A1F : NV-RAM CONTROL.
8. Execute “SAVE ALL ADJUST DATA”
   • After data saving is completed, the message “Save Complete” is displayed.
9. Press the MENU button four times to exit from the maintenance menu.

9-5. RF

After replacing the EQ-72 board or replacing the NV-RAM (IC703/EQ-72), make adjustments proceeding as follows. Allow 20 minutes to begin the adjustment after the unit is powered on.

Adjustment Items

No.	Item		Adjustment point	Remarks
1	Preparation			
2	All RF system adjustment		A17 : A11-A16 ALL ADJUST	Automatic adjustment
		Data save	A1F : NV-RAM CONTROL	
3	EQ RF output level adjustment for BETACAM/BETACAM SP PB			
		METAL Y	A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP101/DM-114
		METAL C	A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP301/DM-114
		OXIDE C	A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP301/DM-114
		OXIDE Y	A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP101/DM-114
		Data save	A3F : NV-RAM CONTROL	

9-5-1. Preparation

Front Panel Setting

REC INHI → OFF

Setting of maintenance mode

- For DNW-A28

1. Set the unit to 625/50 system with setup menu ITEM-013. (Refer to Section 1-19-3.)
2. Set the default value of A30 with maintenance mode and save the data. (Refer to Section 3-2-9.)
3. Set the unit to 525/60 system with setup menu ITEM-013.
4. Set the default value of A30 with maintenance mode and save the data.

- For DNW-A28P

1. Set the unit to 525/60 system with setup menu ITEM-013. (Refer to Section 1-19-3.)
2. Set the default value of A30 with maintenance mode and save the data. (Refer to Section 3-2-9.)
3. Set the unit to 625/50 system with setup menu ITEM-013.
4. Set the default value of A30 with maintenance mode and save the data.

		DNW-A28		DNW-A28P	
		525/60	625/50	625/50	525/60
A30 : EQ VR	RF GAIN METAL-Y-A	50	90	90	50
	RF GAIN METAL-Y-B	50	90	90	50
	RF GAIN METAL-C-A	50	88	88	50
	RF GAIN METAL-C-B	50	88	88	50
	RF GAIN OXIDE-Y-A	60	90	90	60
	RF GAIN OXIDE-Y-B	60	90	90	60
	RF GAIN OXIDE-C-A	60	88	88	60
	RF GAIN OXIDE-C-B	60	88	88	60

9-5-2. Overall RF Adjustment

1. Turn off the power and set S201-1 (D-1) on the SY-260 board to OFF.
2. Turn on the power.
3. Insert the alignment tape SR5-1 or SR5-1P, then cue up to time code 00 : 01 : 00 : 00.
   (DNW-A28 : SR5-1, DNW-A28P : SR5-1P)
4. Activate the maintenance mode. (Refer to Section 9-1-1.)
5. Select A17 : A11-A16 ALL ADJUST.
   - The message “Auto Adjust (Push SET)” is displayed on the video monitor.
6. Press the SET button on the front panel.
   - Automatic adjustment for playback system will be started.
   - After the adjustment is completed, the message “Set a blank tape and push SET button for REC CURRENT adjustment” is displayed on the video monitor.
7. Press the SET button.
   - The message “Insert Blank Tape” is displayed and the alignment tape is ejected.
8. Take out the alignment tape.
9. Insert a blank Betacam SX tape.
   - Automatic recording current adjustment will be started.
   - After the adjustment is completed, the message “Auto Adjust Complete” is displayed on the video monitor.
10. Press the MENU button once to exit from the menu A17 : A11-A16 ALL ADJUST.
11. Select A1F : NV-RAM CONTROL.
12. Execute “SAVE ALL ADJUST DATA”
    - After data saving is completed, the message “Save Complete” is displayed on the video monitor.
13. Press the MENU button four times to exit from the maintenance menu.
14. Eject the Betacam SX tape.
15. Turn off the power and reset S201-1 on the SY-260 board to its factory-set position (ON).

Following this adjustment, perform Section 9-5-3 “EQ RF Output Level Adjustment.”

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9-5-3. EQ RF Output Level Adjustment

Note

Allow 20 minutes to begin adjustment after the unit is powered on.

Measuring equipment : Oscilloscope
(20 MHz BW LIMIT : ON)

Preparation/Setting

1. Select A30 : EQ VR of the maintenance mode.
2. Connect and set the oscilloscope as follows :
   CH-1 : TP112/DM-114 (∗N-4), DC 1 V/DIV
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP101/DM-114 (∗P-4), AC 100 mV/DIV, 2 ms/DIV
   GND : E101/DM-114 (∗P-4)
   Trigger : CH-1

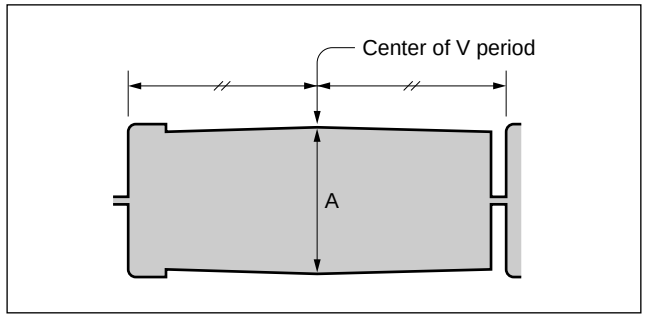
1. METAL Y adjustment

1. Press the SET button, and then play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS. Press the MENU button, and then perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

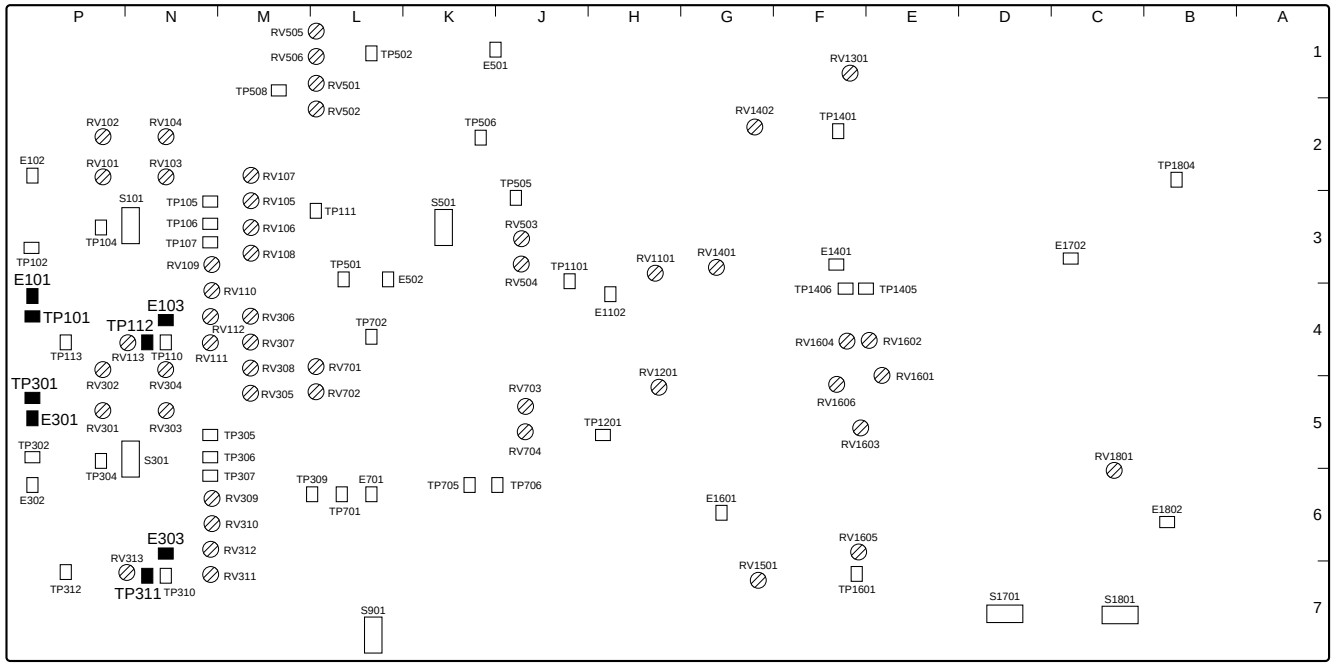
Notes

Adjust respectively for Y-A and Y-B channels.
Observing the Y-A channel, set the trigger of oscilloscope to the negative (−) slope.
Observing the Y-B channel, set the trigger of oscilloscope to the positive (+) slope.

Adjustment points :
Y-A channel : A30 : EQ VR : RF GAIN METAL-Y-A
Y-B channel : A30 : EQ VR : RF GAIN METAL-Y-B
Specifications (Y-A and Y-B channels) :
A = 380 ±20 mV p-p



2. Press the SET button, and then stop the playback of the alignment tape.



DM-114 Board (B Side)

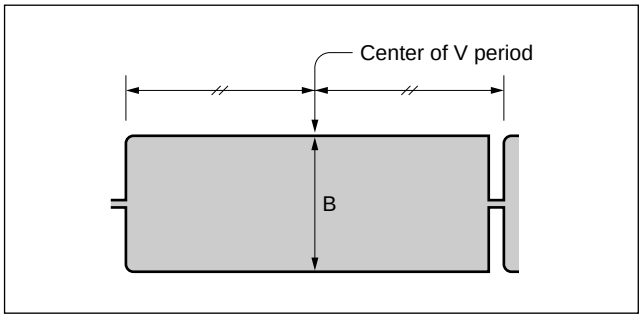
2. METAL C adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP311/DM-114 (∗N-7)
   GND : E303/DM-114 (∗N-6)
   CH-2 : TP301/DM-114 (∗P-5)
   GND : E301/DM-114 (∗P-5)
   Trigger : CH-1
2. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS. Press the MENU button, and then perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

   Notes

   Adjust respectively for C-A and C-B channels.
   Observing the C-A channel, set the trigger of oscilloscope to the negative (−) slope.
   Observing the C-B channel, set the trigger of oscilloscope to the positive (+) slope.

   Adjustment points :
   C-A channel : A30 : EQ VR : RF GAIN METAL-C-A
   C-B channel : A30 : EQ VR : RF GAIN METAL-C-B
   Specifications (C-A and C-B channels) :
   B = 380 ± 20 mV p-p



3. Press the SET button, and then eject the alignment tape.

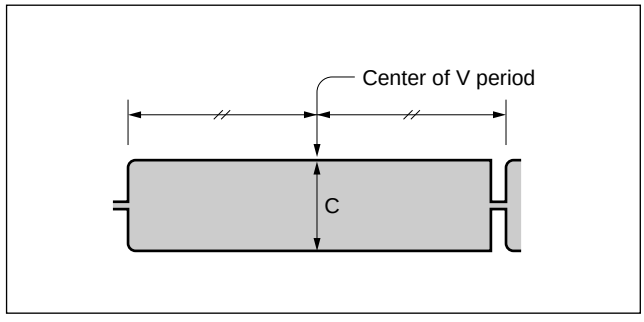
3. OXIDE C adjustment

1. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS. Press the MENU button, and then perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)

   Note

   Adjust respectively for C-A and C-B channels.
   Observing the C-A channel, set the trigger of oscilloscope to the negative (−) slope.
   Observing the C-B channel, set the trigger of oscilloscope to the positive (+) slope.

   Adjustment points :
   C-A channel : A30 : EQ VR : RF GAIN OXIDE-C-A
   C-B channel : A30 : EQ VR : RF GAIN OXIDE-C-B
   Specifications (C-A and C-B channels) :
   C = 250 ± 20 mV p-p



2. Press the SET button, and then stop the playback of the alignment tape.

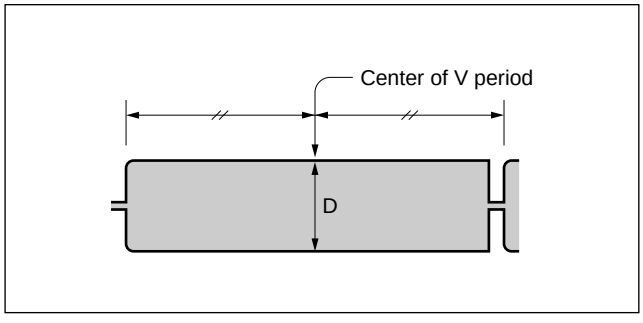
4. OXIDE Y adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP112/DM-114 (∗N-4)
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP101/DM-114 (∗P-4)
   GND : E101/DM-114 (∗P-4)
   Trigger : CH-1
2. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS. Press the MENU button, and then perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)

   Notes

   Adjust respectively for Y-A and Y-B channels.
   Observing the Y-A channel, set the trigger of oscilloscope to the negative (−) slope.
   Observing the Y-B channel, set the trigger of oscilloscope to the positive (+) slope.

   Adjustment points :
   Y-A channel : A30 : EQ VR : RF GAIN OXIDE-Y-A
   Y-B channel : A30 : EQ VR : RF GAIN OXIDE-Y-B
   Specifications (Y-A and Y-B channels) :
   D = 250 ±20 mV p-p



3. Press the SET button, and then eject the alignment tape.
4. To exit from A30 : EQ VR, press the MENU button twice.

5. Saving data

1. Select A3F : NV-RAM CONTROL of the maintenance mode, then execute “SAVE ALL ADJUST DATA”.
2. Check that the message “Save Complete” is displayed on the monitor screen.
3. To exit from A3F : NV-RAM CONTROL, press the MENU button once.
4. To exit the maintenance mode, press the MENU button three times.

9-6. Audio Adjustment

Adjustment Items

No.	Item		Adjustment point	Test point
1	Preparation			
2	Analog audio output level adjustment	CH1/3	⊘RV301/AU-249 (C-2)	AUDIO OUTPUT CH1/3
		CH2/4	⊘RV401/AU-249 (B-2)	AUDIO OUTPUT CH2/4
		MON. L	⊘RV501/AU-249 (E-2)	MONITOR OUTPUT L
		MON. R	⊘RV601/AU-249 (C-2)	MONITOR OUTPUT R
3	Analog audio input level adjustment	CH1	⊘RV141/CP-344 (C-3)	AUDIO OUTPUT CH1/3
		CH2	⊘RV241/CP-344 (D-3)	AUDIO OUTPUT CH2/4
4	AGC level adjustment		⊘RV1/AU-249 (A-4)	AUDIO OUTPUT CH1/3
5	LAU PB frequency response adjustment (OXIDE) (Audio head dumping adjustment)	CH1	⊘RV802/PA-218 (D-1) ⊘RV800/PA-218 (D-1) [S800/PA-218 (D-1)]	AUDIO OUTPUT CH1/3
		CH2	⊘RV803/PA-218 (C-1) ⊘RV801/PA-218 (C-1) [S801/PA-218 (C-1)]	AUDIO OUTPUT CH2/4
6	LAU PB frequency response adjustment	CH1	⊘RV804/PA-218 (E-1)	AUDIO OUTPUT CH1/3
	(METAL) (DNW-A28P only)	CH2	⊘RV805/PA-218 (C-1)	AUDIO OUTPUT CH2/4
7	LAU Dolby level adjustment	CH1	⊘RV101/AU-249 (H-5)	TP102/AU-249 (H-4)
		CH2	⊘RV201/AU-249 (F-5)	TP202/AU-249 (F-4)
8	LAU PB level adjustment	CH1	⊘RV102/AU-249 (H-4)	AUDIO OUTPUT CH1/3
		CH2	⊘RV202/AU-249 (F-4)	AUDIO OUTPUT CH2/4

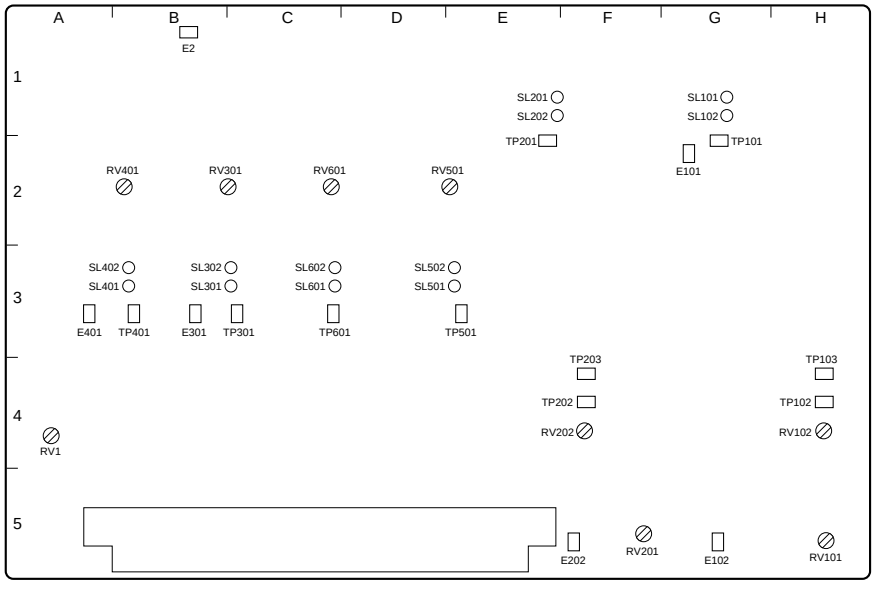
9-6-1. Preparation

Make a photocopy of check sheets given in the Appendix A and write down setup conditions in the check sheets.

Setting the slit-lands on AU-249 board

Set the slit-lands on AU-249 board to their factory-set positions before beginning adjustment.
After adjustments are normally finished, return the slit-lands to their customer-set states and make a fine adjustment for each item. Descriptions about slit-lands are given in the Section 1-8.

Channel	Ref. No. (address)	Item	Factory setting	Customer setting
INPUT CH1	SL101 (G-1) SL102 (G-1)	Analog audio CH1 input headroom	Open (20 dB) Open	
INPUT CH2	SL201 (E-1) SL202 (E-1)	Analog audio CH2 input headroom	Open (20 dB) Open	
OUTPUT CH1/3	SL301 (C-3) SL302 (C-3)	Analog audio CH1/3 output headroom	Open (20 dB) Open	
OUTPUT CH2/4	SL401 (B-3) SL402 (B-3)	Analog audio CH2/4 output headroom	Open (20 dB) Open	
MON. L	SL501 (E-3) SL502 (E-3)	Monitor L output headroom	Open (20 dB) Open	
MON. R	SL601 (C-3) SL602 (C-3)	Monitor R output headroom	Open (20 dB) Open	



AU-249 Board (A Side)

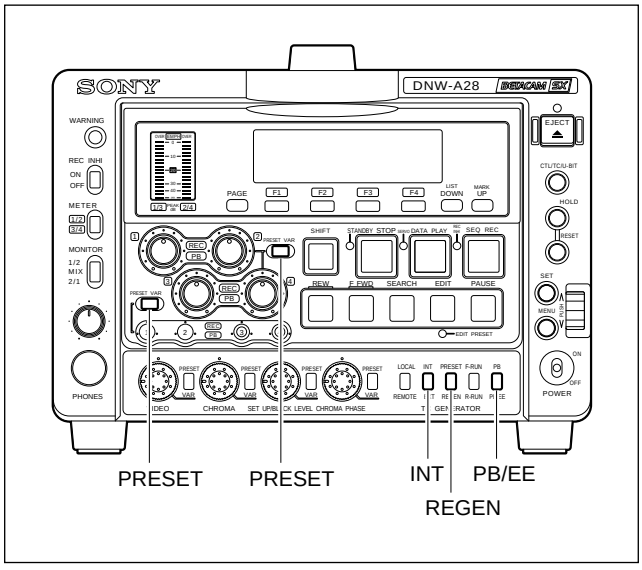
S201/SY-259B Setting

S201-1, 2 (B-1) → ON

Connector Panel Setting

AUDIO INPUT CH1 → +4 dBu
AUDIO INPUT CH2 → +4 dBu

Control Panel Setting



Time Data Display Setting

Press the CTL/TC/U-BIT button to display TC on the display.

Sub Menu Setting

(Regarding the sub menu setting, refer to Section 2 of operation manual.)

AGC	→ON
LIMITER	→OFF
AUDIO INPUT IN-1	→ANALOG1
AUDIO INPUT IN-2	→ANALOG2
MIX/SWAP CH1	→IN-1
MIX/SWAP CH2	→IN-2
EMPH	→OFF
DOLBY	→OFF
LINE OUT	→CH1/2
MONITOR LEVEL	→FIX
MONITOR CH-L	→CH-1
MONITOR CH-R	→CH-2

Setup menu setting

(Regarding the setup menu setting, refer to Section 6 of operation manual.)

- For the DNW-A28
  ITEM-808 : INTERNAL AUDIO SIGNAL GENERATOR
  → 1 kHz (sine)
- For the DNW-A28P
  ITEM-808 : INTERNAL AUDIO SIGNAL GENERATOR
  → 1 kHz (sine)
  ITEM-F01 : AUDIO NR IN SP MODE
  → switch select

Note

After adjustments are completed, return the ITEM-F01 to “ON.”

Maintenance menu setting

M37 : INT AUDIO SG LEVEL →20

9-6-2. Audio Output Level Adjustment

Equipment : Audio analyzer

Preparation/Setting

1. Set AU SG (in the audio setting page of the sub menu) to ON to output a 1 kHz −20 dBFS audio signal. (Regarding the sub menu setting, refer to Section 2 of operation manual.)

1. CH1/3 adjustment

1. Connect the input of audio analyzer to the AUDIO OUTPUT CH1/3 connector.
   Adjustment Point : ⊘RV301/AU-249 (C-2)
   Specification : +4.0 ±0.1 dBu (600 Ω load)

2. CH2/4 adjustment

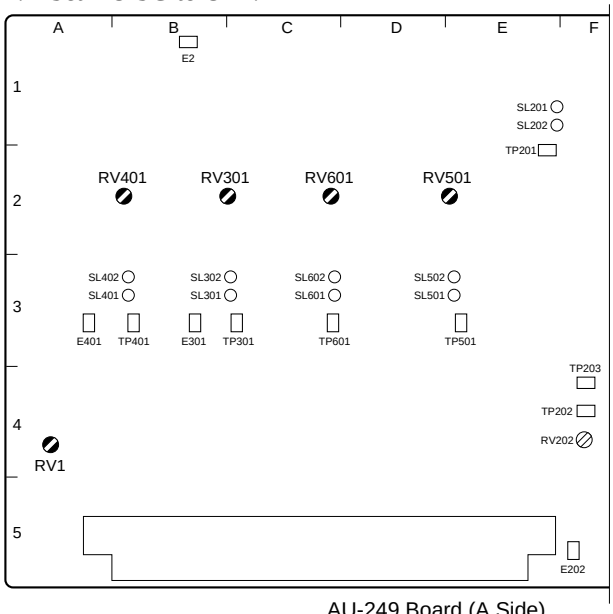
1. Connect the input of audio analyzer to the AUDIO OUTPUT CH2/4 connector.
   Adjustment Point : ⊘RV401/AU-249 (B-2)
   Specification : +4.0 ±0.1 dBu (600 Ω load)

3. MON.L adjustment

1. Connect the input of audio analyzer to the MONITOR OUTPUT L connector.
   Adjustment Point : ⊘RV501/AU-249 (E-2)
   Specification : +4.0 ±0.1 dBu (600 Ω load)

4. MON.R adjustment

1. Connect the input of audio analyzer to the MONITOR OUTPUT R connector.
   Adjustment Point : ⊘RV601/AU-249 (C-2)
   Specification : +4.0 ±0.1 dBu (600 Ω load)
2. Set AU SG to OFF.



AU-249 Board (A Side)

9-6-3. Analog audio input Level Adjustment

Equipment : Audio analyzer

1. CH1 adjustment

1. Connect the input of audio analyzer to the AUDIO OUTPUT CH1/3 connector.
2. Feed a 1 kHz, +4 dBu signal from the audio signal generator to the AUDIO INPUT CH1 connector.
   Adjustment Point : ⊘RV141/CP-344 (C-3)
   Specification : +4.0 ±0.1 dBu (600 Ω load)

2. CH2 adjustment

1. Connect the input of audio analyzer to the AUDIO OUTPUT CH2/4 connector.
2. Feed a 1 kHz, +4 dBu signal from the audio signal generator to the AUDIO INPUT CH1 connector.
   Adjustment Point : ⊘RV241/CP-344 (D-3)
   Specification : +4.0 ±0.1 dBu (600 Ω load)

9-6-4. AGC Level Adjustment

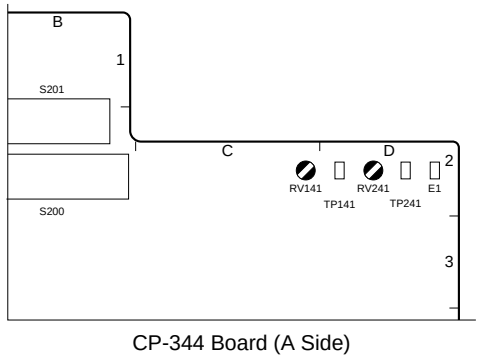
Equipment : Audio analyzer

1. Sub menu setting

(Regarding the sub menu setting, refer to Section 2 of operation manual.)

- Audio setting page
  AGC → ON

2. Connect the input of audio analyzer to the AUDIO OUTPUT CH1/3 connector.
3. Feed a 1 kHz, +4 dBu signal from the audio signal generator to the AUDIO INPUT CH1 connector.
   Adjustment Point : ⊘RV1/AU-249 (A-4)
   Specification : +4.0 ±0.1 dBu (600 Ω load)



CP-344 Board (A Side)

9-6-5. LAU PB Frequency Response Adjustment (OXIDE)

Measuring equipment : Audio analyzer

1. CH1 adjustment

1. Connect the input of audio analyzer to the AUDIO OUTPUT CH1/3 connector.
2. Play back the following specified portions (−20 VU) of the alignment tape CR8-1A or CR8-1A PS, and perform the adjustments or check. (DNW-A28 : CR8-1A, DNW-A28P : CR8-1A PS)

Note

If the specification for ⊘RV800 adjustment is not met, switch over S800/PA-218 (D-1) and adjust again.

2. CH2 adjustment

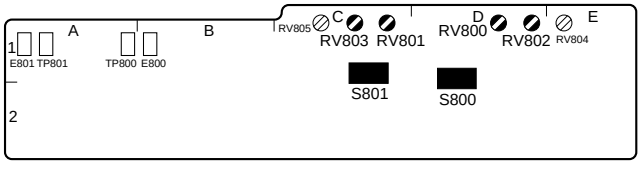
1. Connect the input of audio analyzer to the AUDIO OUTPUT CH2/4 connector.
2. Play back the following specified portions (−20 VU) of the alignment tape CR8-1A or CR8-1A PS, and perform the adjustments or check. (DNW-A28 : CR8-1A, DNW-A28P : CR8-1A PS)

Note

If the specification for ⊘RV801 adjustment is not met, switch S801/PA-218 (C-1) and adjust again.

Playback portions	Specifications[dB]		Adjustment points
	DNW-A28	DNW-A28P	
5 : 00 to 5 : 55 (1 kHz, −20 VU)	Regard a measured value as reference (0 dB).	Regard a measured value as reference (0 dB).	–
6 : 00 to 6 : 25 (40 Hz, −20 VU)	C.V. $^{+0.7}_{-1.7}$	C.V. $^{+0.7}_{-1.7}$	(Check only)
6 : 30 to 6 : 55 (7 kHz, −20 VU)	C.V. ±0.3	C.V. ±0.4	CH-1 : ⊘RV802/PA-218 (D-1) CH-2 : ⊘RV803/PA-218 (C-1)
7 : 00 to 7 : 25 (10 kHz, −20 VU)	C.V. ±0.3	C.V. ±0.4	(Check only)
7 : 30 to 7 : 55 (15 kHz, −20 VU)	C.V. $^{+0.3}_{-1.0}$	C.V. $^{-1.0}_{-1.7}$	CH-1 : ⊘RV800/PA-218 (D-1) CH-2 : ⊘RV801/PA-218 (C-1)

The correction values (C.V.) are given on the label of the alignment tape.



PA-218 Board (A Side)

9-6-6. LAU PB Frequency Response Adjustment (METAL)

Measuring equipment : Audio analyzer

1. CH1 adjustment

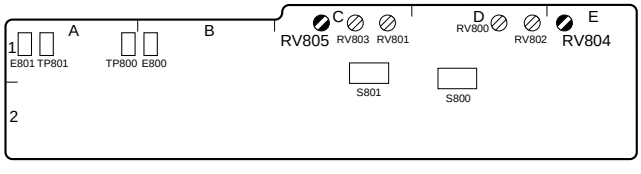
1. Connect the input of audio analyzer to the AUDIO OUTPUT CH1/3 connector.
2. Play back the following specified portions (−20 VU) of alignment tape CR8-1A PS, and perform the adjustment and checks.

2. CH2 adjustment

1. Connect the input of audio analyzer to the AUDIO OUTPUT CH2/4 connector.
2. Play back the following specified portions (−20 VU) of alignment tape CR8-1A PS, and perform the adjustment or check.

Playback portions	Specifications[dB]	Adjustment point
5 : 00 to 5 : 55 (1 kHz, −20 VU)	Regard a measured value as reference (0 dB).	–
6 : 00 to 6 : 25 (40 Hz, −20 VU)	C.V. $^{+0.7}_{-1.7}$	(Check only)
6 : 30 to 6 : 55 (7 kHz, −20 VU)	C.V. ±0.3	(Check only)
7 : 00 to 7 : 25 (10 kHz, −20 VU)	C.V. ±0.4	(Check only)
7 : 30 to 7 : 55 (15 kHz, −20 VU)	C.V. ±0.5	CH-1 : ⊘RV804/PA-218 (E-1) CH-2 : ⊘RV805/PA-218 (C-1)

The correction values (C.V.) are given on the label of the alignment tape.



PA-218 Board (A Side)

9-6-7. LAU Dolby Level Adjustment

Measuring equipment : Audio level meter

1. CH1 adjustment

1. Connect the audio level meter to TP102/AU-249 (H-4).
   GND : E102/AU-249 (G-5)
2. Play back the 1 kHz, 0 VU portion (0 : 00 to 2 : 55) of alignment tape CR8-1A or CR8-1B PS, and perform the level adjustment. (DNW-A28 : CR8-1A, DNW-A28P : CR8-1B PS)
   Adjustment point : ⊘RV101/AU-249 (H-5)
   Specification : −10.0 ±0.1 dBu

2. CH2 adjustment

1. Connect the audio level meter to TP202/AU-249 (F-4).
   GND : E202/AU-249 (F-5)
2. Play back the 1 kHz, 0 VU portion (0 : 00 to 2 : 55) of alignment tape CR8-1A or CR8-1B PS, and perform the level adjustment. (DNW-A28 : CR8-1A, DNW-A28P : CR8-1B PS)
   Adjustment point : ⊘RV201/AU-249 (F-5)
   Specification : −10.0 ±0.1 dBu

9-6-8. LAU PB Level Adjustment

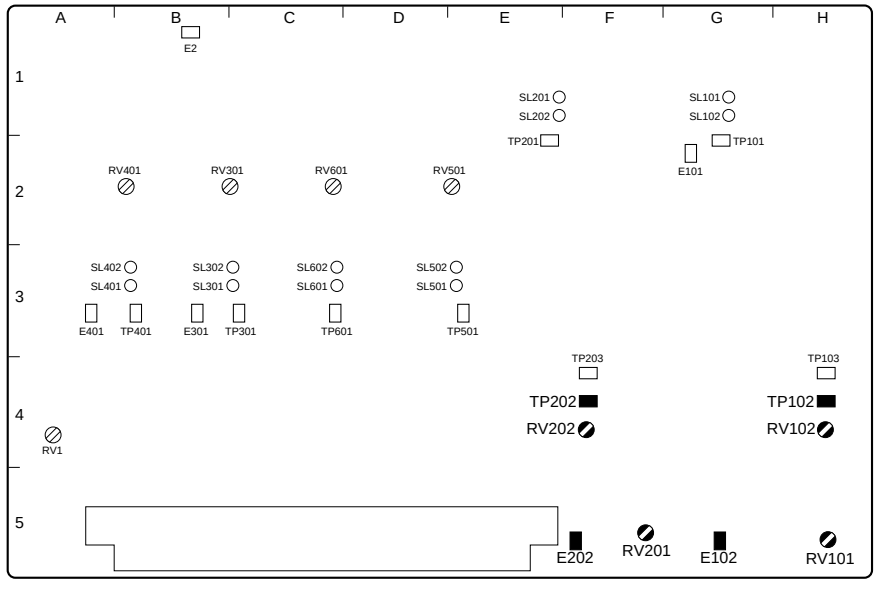
Measuring equipment : Audio analyzer

1. CH1 adjustment

1. Connect the input of audio analyzer to the AUDIO OUTPUT CH1/3 connector.
2. Play back the 1 kHz, 0 VU portion (0 : 00 to 2 : 55) of alignment tape CR8-1A or CR8-1B PS, and perform the level adjustment. (DNW-A28 : CR8-1A, DNW-A28P : CR8-1B PS)
   Adjustment point : ⊘RV102/AU-249 (H-4)
   Specification : +4.0 ±0.1 dBu (600 Ω load)

2. CH2 adjustment

1. Connect the input of audio analyzer to the AUDIO OUTPUT CH2/4 connector.
2. Play back the 1 kHz, 0 VU portion (0 : 00 to 2 : 55) of alignment tape CR8-1A or CR8-1B PS, and perform the level adjustment. (DNW-A28 : CR8-1A, DNW-A28P : CR8-1B PS)
   Adjustment point : ⊘RV202/AU-249 (F-4)
   Specification : +4.0 ±0.1 dBu (600 Ω load)



AU-249 Board (A Side)

http://getMANUAL.com

9-7. Reference Signal / Video Processing

The NV-RAM (IC406) on the TG-191/191P board is storing adjustment data for the TG-191/191P and VPR-34 boards. After replacing this NV-RAM or the TG-191/191P board, be sure to perform adjustments for the following all items. After replacing the VPR-34 board, perform adjustment items 1, 2, 5 and 6.

Note

Adjustments for video processing circuit are required for both 525/60 and 625/50 systems.
Regarding system selection, refer to Section 1-19-3.

Adjustment Items

No.	Item		Adjustment point	Test point
1	Preparation			
2	Composite video output level adjustment (525/60 system)			
		CH1/CH2	A20 : VPR/TG VR : VIDEO LEVEL	VIDEO OUTPUT
		Data save	A2F : NV-RAM CONTROL	
3	Internal 4fsc frequency adjustment (525/60 system)			
			A20 : VPR/TG VR : INT 4Fsc FREQ	TP102/TG-191(C-2)
		Data save	A2F : NV-RAM CONTROL	
4	Reference color frame pulse confirmation (for DNW-A28 only)			
			A20 : VPR/TG VR : REF 1st FLD DET	TP103/TG-191(D-2)
		Data save	A2F : NV-RAM CONTROL	
5	Switching to 625/50 system			
6	Composite video output level adjustment (625/50 system)			
		CH1/CH2	A20 : VPR/TG VR : VIDEO LEVEL	VIDEO OUTPUT
		Data save	A2F : NV-RAM CONTROL	
7	Internal 4fsc frequency adjustment (625/50 system)			
			A20 : VPR/TG VR : INT 4Fsc FREQ	TP102/TG-191(C-2)
		Data save	A2F : NV-RAM CONTROL	
8	Reference color frame pulse confirmation (for DNW-A28P only)			
			A20 : VPR/TG VR : REF 1st FLD DET	TP103/TG-191(D-2)
		Data save	A2F : NV-RAM CONTROL	

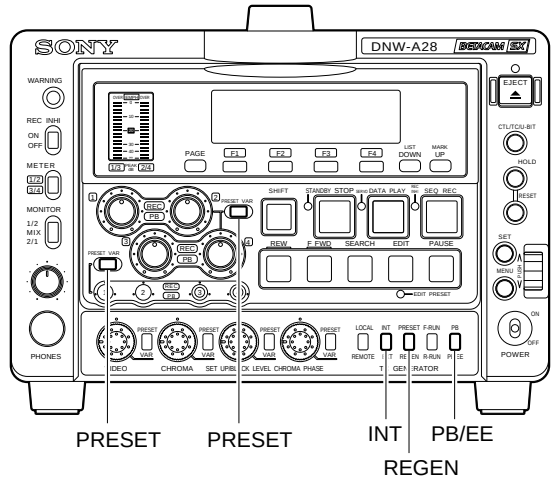
9-7-1. Preparation

Make a photocopy of check sheets given in the Appendix A and write down setup conditions in the check sheets.

1. Setting of S201/SY-259B board

S201-1, 2 (B-1) → ON

2. Front Panel setting



3. Video System Setting

(Regarding video system setting, refer to Section 1-19-2.)
Confirm that the unit is set to 525/60 system with the setup menu ITEM-013.

4. Sub menu Setting

(Regarding the sub menu setting, refer to Section 2 of operation manual.)

- General setting page
  SUPER → ON
- Video setting page
  PROCESS CONTROL → PANEL
  Y/C DLY → 800 PRESET
  SYNC PH → 80
  SC PH → 80

5. Setup menu setting

(Regarding the setup menu setting, refer to section 1-19, or secti on 6 of operation manual.)

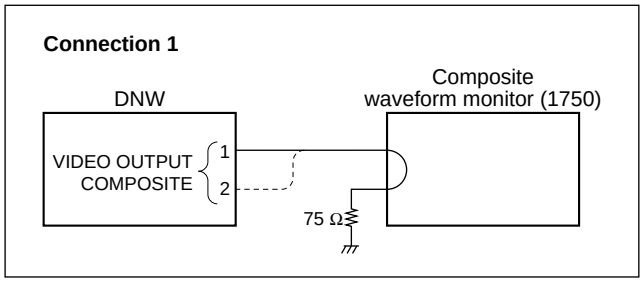
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
SUB-ITEM 0 : MASTER LEVEL → 7.5 %
1 : INPUT LEVEL → MSTER
2 : INPUT VBLK CNT → THROU
3 : BETACAM PB LEVEL → MSTER
4 : OUTPUT LEVEL → MSTER

9-7-2. Composite Video Output Level Adjustment (525/60 system)

Note

Allow 30 minutes to begin adjustment after the unit is powered on.

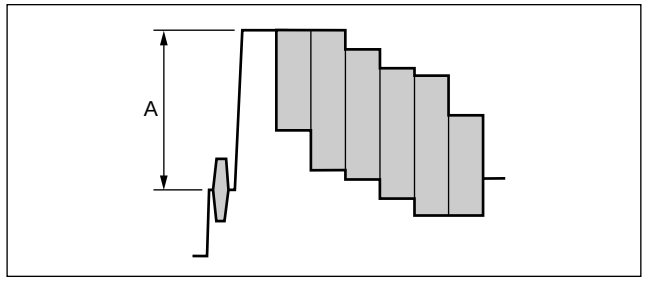
Measuring equipment : Composite waveform monitor



1. Connect the composite waveform monitor as shown in Connection 1.
2. Activate the maintenance mode.
   (Refer to Section 9-1-1.)
3. Select C2 : AUDIO/VIDEO CHECK.
4. Select C21 : VIDEO TEST SG.
5. Video signal selection
   Press and turn the JOG dial slowly until a test signal name “75 % Color Bars” is displayed.
6. Press the MENU button once to exit from C21 : VIDEO TEST SG.
7. Press the MENU button again to exit from C2 : AUDIO/VIDEO CHECK.
8. Select A2 : AUDIO/VIDEO ADJUST.
9. Select A20 : VPR/TG VR.
10. Adjustment and check
    Adjust the level at white signal portion so that the specification is satisfied.
    Adjustment point :
    A20 : VPR/TG VR : VIDEO LEVEL
    Specification : A = 100 ±1 IRE (A = 714 ± 7 mV)

    Notes

    - It is impossible to adjust the outputs of VIDEO OUTPUT 1 and 2 (SUPER) connectors separately.
    - Check operation only is enabled for the output of VIDEO OUTPUT 2 (SUPER) connector.
      When observing the VIDEO OUTPUT 2 (SUPER) connector output, set “SUPER” in sub menu to OFF.
      (Refer to the operation manual, Section 2-9.)



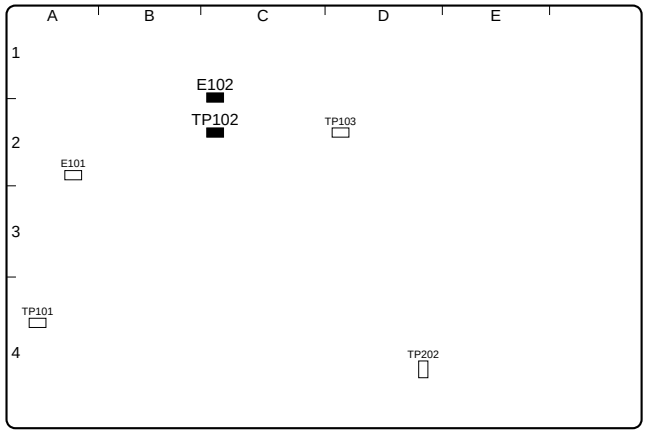
11. Press the MENU button to exit from A20 : VPR/TG VR.
12. Saving data
    Select A2F : NV-RAM CONTROL of the maintenance mode, then execute “SAVE ALL ADUST DATA”.
13. Check that the message “Save Complete” is displayed on the monitor.
14. Press the MENU button to exit from A2F : NV-RAM CONTROL.
15. Press the MENU button three times to exit from the maintenance mode.

9-7-3. Internal 4 fsc Frequency Adjustment (525/60 system)

Measuring equipment : Frequency counter

1. Supply no signal to REF. VIDEO connector.
2. Connect the frequency counter to TP102/TG-191(C-2).
   GND : E102/TG-191(C-1)
3. Start up the maintenance mode.
   (Refer to Section 9-1-1.)
4. Select “A20 : VPR/TG VR.”
5. Adjust frequency as follows :
   Adjustment point : A20 : VPR/TG VR : INT 4 FSC FREQ
   Specification : 14,318,181 ±50 Hz

6. Saving data
   Select A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA.”
7. Check that the message “Save Complete” is displayed on the monitor.
8. Press the MENU button to exit from A2F : NV-RAM CONTROL.
9. Press the MENU button three times to exit from the maintenance mode.

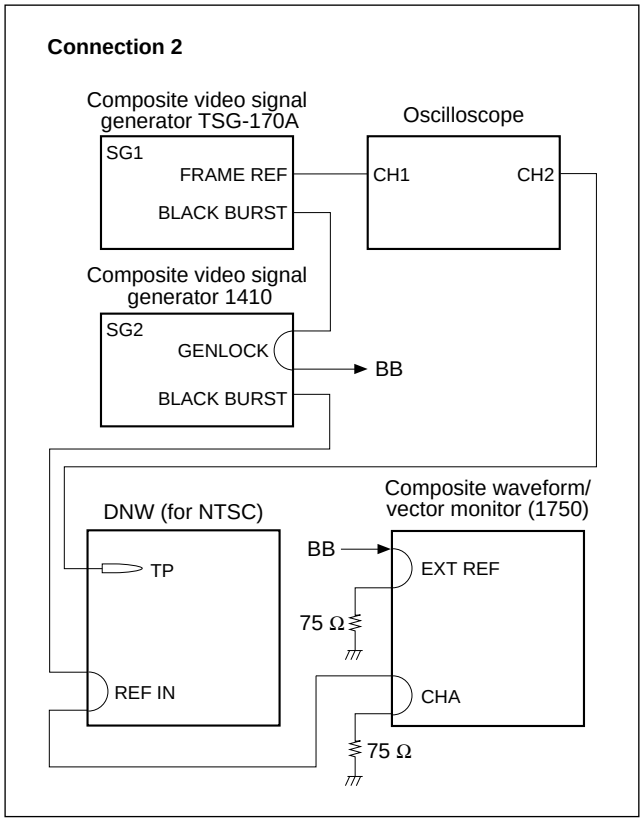


TG-191 Board (A Side)

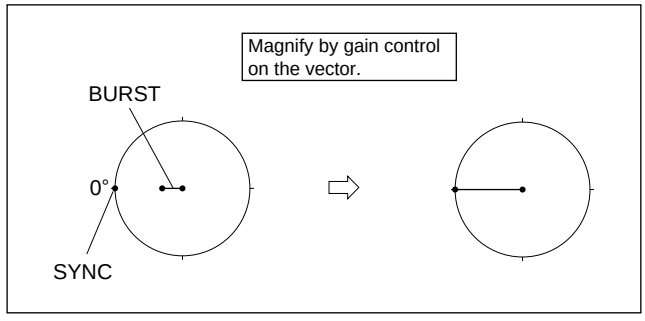
9-7-4. Reference Color Frame Pulse Confirmation (for DNW-A28 only)

This adjustment is unnecessary for DNW-A28P.

Measuring equipment : Component waveform/vector monitor and Oscilloscope

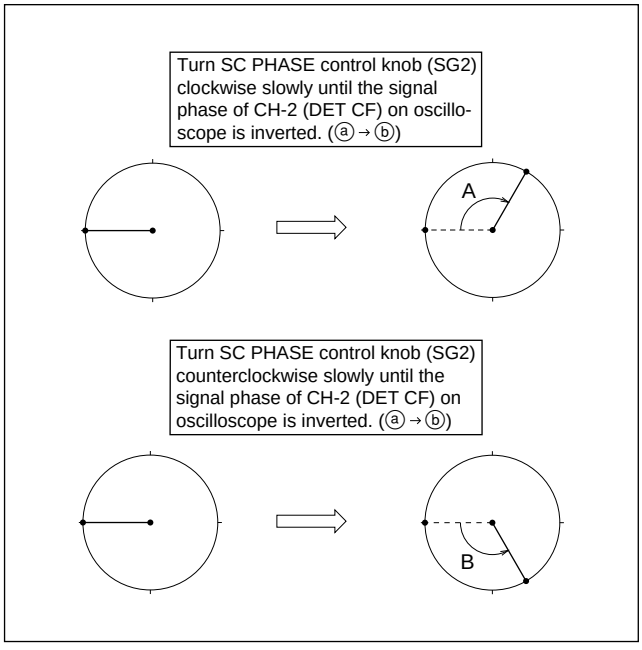


1. Connect the video signal generator, component waveform/vector monitor (called “vector” after this), and oscilloscope as shown in Connection 2.
2. Set the vector as follows.
   SCH mode, INPUT : CH-A, EXT REF
3. Align the SYNC phase with 0 degree using the vector’s PHASE control so that the beam spot (SYNC) moves in the shortest route. (See the figure below.)

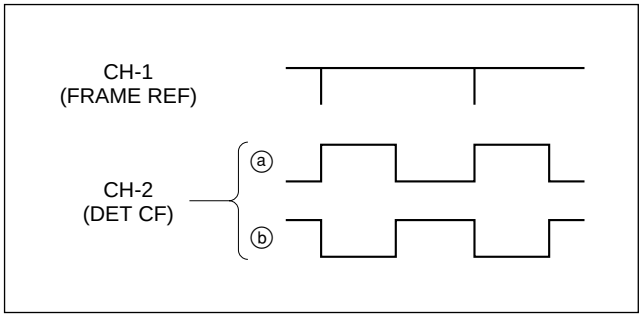


4. Align the BURST signal with its reference position on the vector using the signal generator SG2’s SC PHASE control.
5. Align the beam spot (s) on the BURST signal with the circle scale on the vector using the gain control of the vector.
6. Connect and set the oscilloscope as follows :
   Display : ALT mode
   CH-1 : DC 2 V/DIV
   (Connected to SG1’s FRAME REF output)
   CH-2 : TP103/TG-191 (D-2), DC 2 V/DIV
   GND : E102/TG-191 (C-1)
   TIME : 10 ms/DIV
   Trigger : CH-1
7. Turn the signal generator SG2’s SC PHASE control counterclockwise ↺ slowly until the waveform of the oscilloscope’s CH-2 (DET CF) changes from ⓐ to ⓑ.
8. Measure the BURST phase (angle A) on the vector just when the waveform of the oscilloscope changes.
9. Turn the SG2’s SC PHASE control clockwise ↻ to return the BURST signal on the vector to its normal position.
10. Turn the signal generator SG2’s SC PHASE control clockwise ↻ slowly until the waveform of the oscilloscope’s CH-2 (DET CF) changes from ⓐ to ⓑ.
11. Measure the BURST phase (angle B) on the vector just when the waveform of the oscilloscope changes.
12. Turn the SG2’s SC PHASE control counterclockwise ↺ to return the BURST signal on the vector to its normal position.

13. Confirm that the difference between the angles A and B is within specification. If not, continue the steps 14 through 17.
    Specification : A − B = 0 ±10°


Turn SC PHASE control knob (SG2) clockwise slowly until the signal phase of CH-2 (DET CF) on oscillo-scope is inverted. (ⓐ→ⓑ)
A
Turn SC PHASE control knob (SG2) counterclockwise slowly until the signal phase of CH-2 (DET CF) on oscilloscope is inverted. (ⓐ→ⓑ)
B

Vector



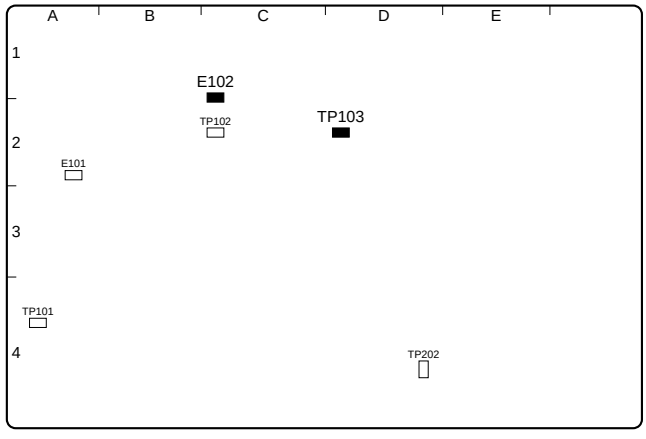
Oscilloscope

Perform the following steps 14 through 17 only when the specification of step 13 is not satisfied.

14. Start up the maintenance mode.
    (Refer to Section 9-1-1.)
15. Select “A20 : VPR/TG VR.”
16. Add/subtract 1 to/from the data value of “REF 1ST FLD DET”.
    Note
    The increase/decrease of data value depends on the relationship between the angles A and B measured in steps 8 and 11. (To change the data value, press and turn the JOG dial.)
    A>B : Subtract 1 from the data value.
    (Turn the JOG dial in UPWARD direction)
    B>A : Add 1 to the data value.
    (Turn the JOG dial in DOWNWARD direction)
17. Press the MENU button once to exit from A20 : VPR/TG VR.
18. Repeat from step 7.

Perform the following steps 19 through 21 only when the REF 1ST FLD DET’s data value of A20 : VPR/TG VR is changed.

19. Saving data
    Select A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA.”
20. Check that the message “Save Complete” is displayed on the monitor.
21. Press the MENU button once to exit from A2F : NV-RAM CONTROL.
22. Press the MENU button three times to exit from the maintenance mode.



TG-191 Board (A Side)

9-7-5. Switching to 625/50 System

1. Video System Setting

Set the unit to 625/50 system with setup menu ITEM-013. (Refer to Section 1-19-2.)

2. Sub menu Setting

(Regarding the sub menu setting, refer to Section 2 of operation manual.)

- General setting page
  SUPER → ON
- Video setting page
  PROCESS CONTROL → PANEL
  Y/C DLY → 800 PRESET
  SYNC PH → 80
  SC PH → 80

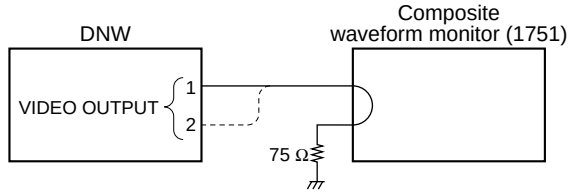
9-7-6. Composite Video Output Level Adjustment (625/50 system)

Note

Allow 30 minutes to begin adjustment after the unit is powered on.

Measuring equipment : Composite waveform monitor

Connection 3

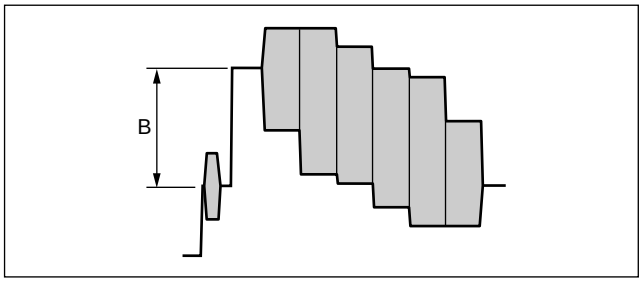


1. Connect the composite waveform monitor as shown in Connection 3.
2. Activate the maintenance mode.
   (Refer to Section 9-1-1.)
3. Select C2 : AUDIO/VIDEO CHECK.
4. Select C21 : VIDEO TEST SG.
5. Video signal selection
   Press and turn the JOG dial slowly until a test signal name “100 % Color Bars” is displayed.
6. Press the MENU button once to exit from C21 : VIDEO TEST SG.
7. Press the MENU button again to exit from C2 : AUDIO/VIDEO CHECK.
8. Select A2 : AUDIO/VIDEO ADJUST.
9. Select A20 : VPR/TG VR.

10. Adjustment and check
    Adjust the level at white signal portion so that the specification is satisfied.
    Adjustment point : A20 : VPR/TG VR : VIDEO LEVEL
    Specification : B = 700 ± 7 mV

Notes

- It is impossible to adjust the outputs of VIDEO OUTPUT 1 and 2 (SUPER) connectors separately.
- Check operation only is enabled for the output of VIDEO OUTPUT 2 (SUPER) connector.
  When observing the VIDEO OUTPUT 2 (SUPER) connector output, set "SUPER" in sub menu to OFF. (Refer to the operation manual, Section 2-9.)

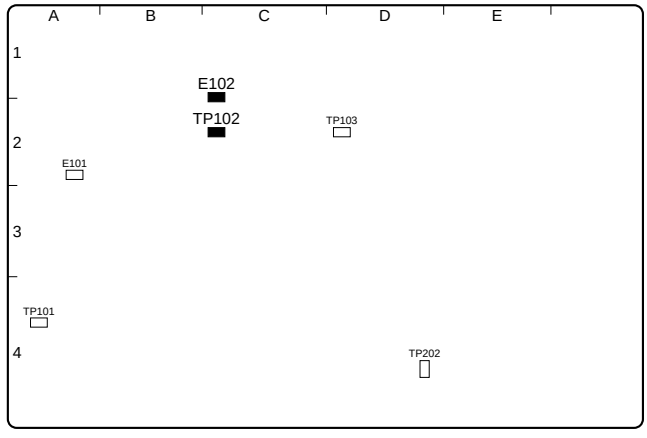


11. Press the MENU button so as to exit from A20 : VPR/TG VR.
12. Saving data
    Select A2F : NV-RAM CONTROL of the maintenance mode, then execute "SAVE ALL ADUST DATA."
13. Check that the message "Save Complete" is displayed on the monitor.
14. Press the MENU button to exit from A2F : NV-RAM CONTROL.
15. Press the MENU button three times to exit from the maintenance mode.

9-7-7. Internal 4 fsc Frequency Adjustment (625/50 system)

Measuring equipment : Frequency counter

1. Supply no signal to REF. VIDEO connector.
2. Connect the frequency counter to TP102/TG-191(C-2).
   GND : E102/TG-191(C-1)
3. Start up the maintenance mode.
   (Refer to Section 9-1-1.)
4. Select "A20 : VPR/TG VR."
5. Adjust frequency as follows :
   Adjustment point : A20 : VPR/TG VR : INT 4 FSC FREQ
   Specification : 17,734,475 ± 50 Hz
6. Saving data
   Select A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA."
7. Check that the message "Save Complete" is displayed on the monitor.
8. Press the MENU button to exit from A2F : NV-RAM CONTROL.
9. Press the MENU button three times to exit from the maintenance mode.

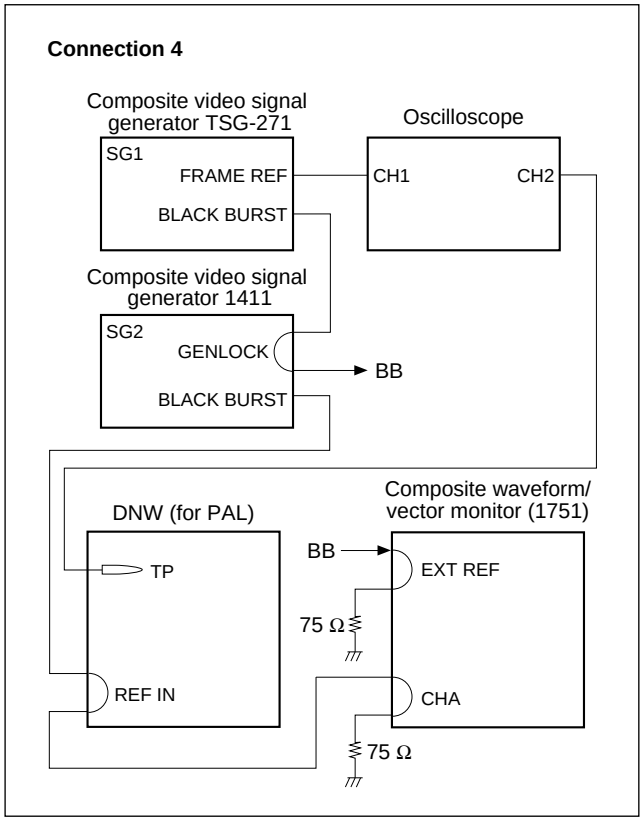


TG-191 Board (A Side)

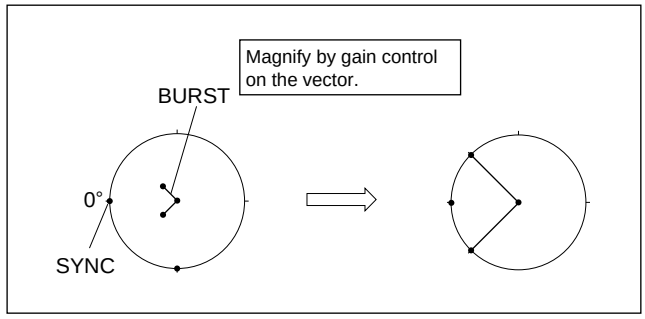
9-7-8. Reference Color Frame Pulse Confirmation (for DNW-A28P only)

This adjustment is unnecessary for DNW-A28.

Measuring equipment : Component waveform/vector monitor and Oscilloscope

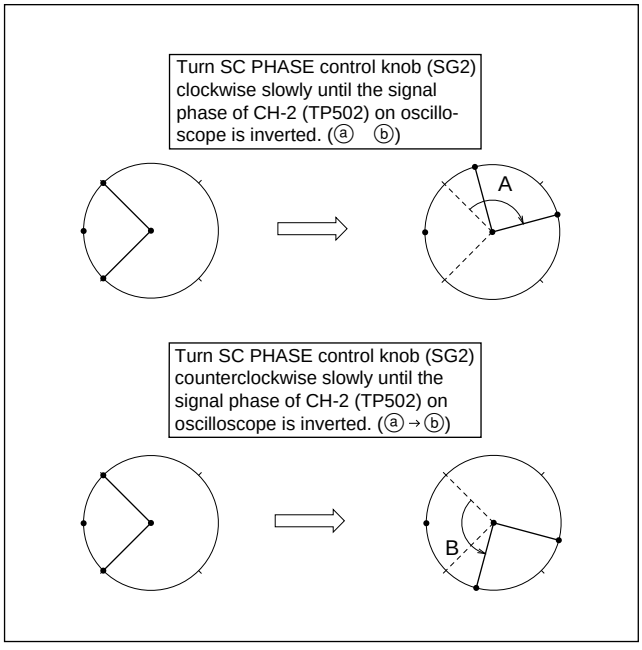


1. Connect the video signal generator, component waveform/vector monitor (called “vector” after this), and oscilloscope as shown in Connetion 4.
2. Set the vector as follows.
   SCH mode, INPUT : CH-A, EXT REF
3. Align the SYNC phase with 0 degree using the vector’s PHASE control so that the beam spot (SYNC)

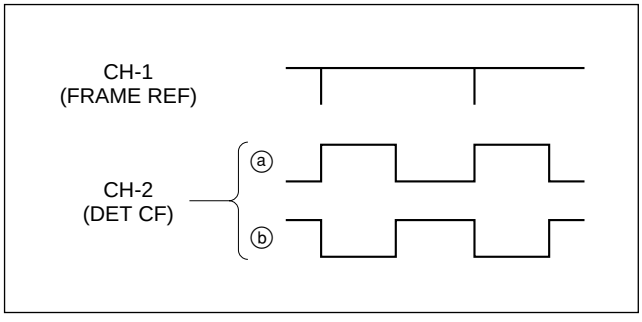


   moves in the shortest route. (See the figure below.)
4. Align the BURST signal with its reference position on the vector using the signal generator SG2’s SC PHASE control.
5. Align the beam spot (s) on the BURST signal with the circle scale on the vector using the gain control of the vector.
6. Connect and set the oscilloscope as follows :
   Display : ALT mode
   CH-1 : DC 2 V/DIV
   (Connected to SG1’s FRAME REF output)
   CH-2 : TP103/TG-191P (D-2), DC 2 V/DIV
   GND : E102/TG-191P (C-1)
   TIME : 20 ms/DIV
   Trigger : CH-1
7. Turn the signal generator SG2’s SC PHASE control counterclockwise ↺ slowly until the waveform of the oscilloscope’s CH-2 (DET CF) changes from ⓐ to ⓑ.
8. Measure the BURST phase (angle A) on the vector just when the waveform of the oscilloscope changes.
9. Turn the SG2’s SC PHASE control clockwise ↻ to return the BURST signal on the vector to its normal position.
10. Turn the signal generator SG2’s SC PHASE control clockwise ↻ slowly until the waveform of the oscilloscope’s CH-2 (DET CF) changes from ⓐ to ⓑ.
11. Measure the BURST phase (angle B) on the vector just when the waveform of the oscilloscope changes.
12. Turn the SG2’s SC PHASE control counterclockwise ↺ to return the BURST signal on the vector to its normal position.

13. Confirm that the difference between the angles A and B is within specification. If not, continue the steps 14 through 17.
    Specification : A − B = 0 ±10°


Turn SC PHASE control knob (SG2) clockwise slowly until the signal phase of CH-2 (TP502) on oscillo-scope is inverted. (ⓐ ⓑ)
A
Turn SC PHASE control knob (SG2) counterclockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ → ⓑ)
B

Vector



Oscilloscope

Perform the following steps 14 through 18 only when the specification of step 13 is not satisfied.

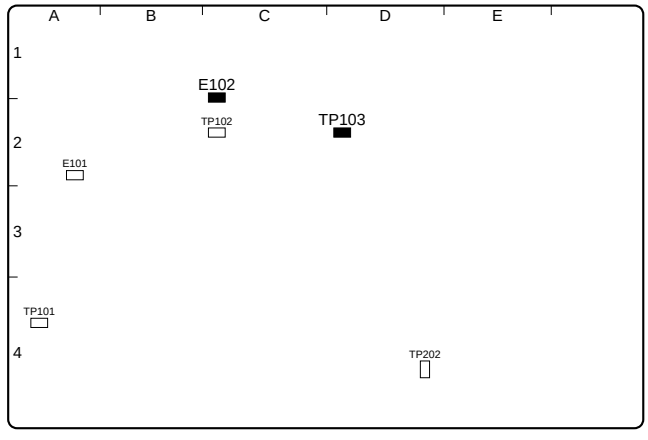
14. Start up the maintenance mode.
    (Refer to Section 9-1-1.)
15. Select “A20 : VPR/TG VR.”
16. Add/subtract 1 to/from the data value of “REF 1ST FLD DET.”

    Note

    The increase/decrease of data value depends on the relationship between the angles A and B measured in steps 8 and 11. (To change the data value, press and turn the JOG dial.)
    A>B : Subtract 1 from the data value.
    (Turn the JOG dial in UPWARD direction)
    B>A : Add 1 to the data value.
    (Turn the JOG dial in DOWNWARD direction)
17. Press the MENU button once to exit from A20 : VPR/TG VR.
18. Repeat from step 7.

Perform the following steps 19 through 21 only when the REF 1ST FLD DET’s data value of A20 : VPR/TG VR is changed.

19. Saving data
    Select A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA.”
20. Check that the message “Save Complete” is displayed on the monitor.
21. Press the MENU button once to exit from A2F : NV-RAM CONTROL.
22. Press the MENU button three times to exit from the maintenance mode.
23. Return all the settings established in Section 9-7-1 “Preparation” to their normal states.



TG-191 Board (A Side)

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9-8. Composite Decoder

The EEPROM (IC34/DEC-97) is storing adjustment data for the DEC-97 board. After replacing this EEPROM or the DEC-97 board, be sure to perform adjustments for the following all items.

Note

Adjustments for composite decoder are required for both 525/60 system and 625/50 system.

Adjustment Items

No.	Item		Adjustment point	Test point
1.	Preparation			
2.	Pedestal level adjustment		A25 : DEC VR : PEDESTAL	VIDEO OUTPUT 1
	(525/60 system)	Data save	A2F : NV-RAM COMTROL	
3.	Analog composite input level adjustment			
	(525/60 system)		A26 : DEC VR (LOOP) : VIDEO GAIN	VIDEO OUTPUT 2 (SUPER)
		Data save	A2F : NV-RAM COMTROL	
4.	Pedestal level check (525/60 system)		Check only	VIDEO OUTPUT 1
5.	Composite Input color frame detect adjustment			
	(525/60 system)		A24 : INPUT CF DETECT	VIDEO OUTPUT 1
		Data save	A2F : NV-RAM COMTROL	
6.	Switching to 625/50 system			
7.	Pedestal level adjustment		A25 : DEC VR : PEDESTAL	VIDEO OUTPUT 1
	(625/50 system)	Data save	A2F : NV-RAM COMTROL	
8.	Analog composite input level adjustment			
	(625/50 system)		A26 : DEC VR (LOOP) : VIDEO GAIN	VIDEO OUTPUT 2 (SUPER)
		Data save	A2F : NV-RAM CONTROL	
9.	Pedestal level check (625/50 system)		Check only	VIDEO OUTPUT 1
10.	Composite Input color frame detect adjustment			
	(625/50 system)		A24 : INPUT CF DETECT	VIDEO OUTPUT 1
		Data save	A2F : NV-RAM CONTROL	

Equipment

Oscilloscope (TEKTRONIX 2465B or equivalent)
Analog composite NTSC signal generator (TEKTRONIX TSG-170A or equivalent)
Analog composite PAL signal generator (TEKTRONIX TSG-271 or equivalent)
NTSC waveform/vector monitor (TEKTRONIX 1750 or equivalent)
PAL waveform/vector monitor (TEKTRONIX 1751 or equivalent)
Video monitor

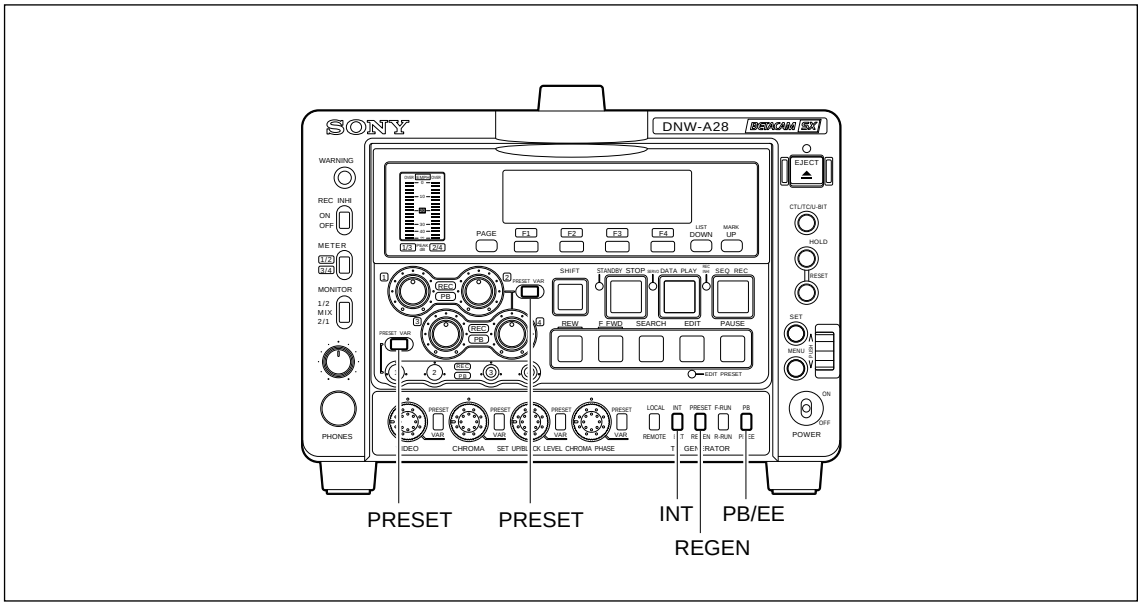
9-8-1. Preparation

Make a photocopy of check sheets given in the Appendix A and write down setup conditions in the check sheets.

1. Setting of S201/SY-259B board

S201-1, 2 → ON

2. Front Panel setting



3. Video System Setting

(Regarding video system setting, refer to Section 1-19-2.)
Confirm that the unit is set to 525/60 system with the setup menu ITEM-013.

4. Sub menu Setting

(Regarding the sub menu setting, refer to Section 2 of operation manual.)

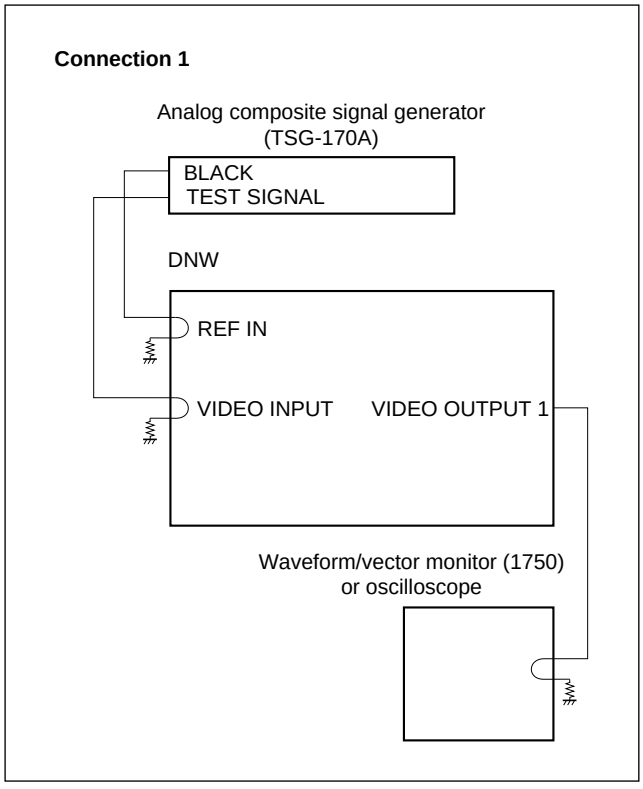
- General setting page
  SUPER → ON
- Video setting page
  PROCESS CONTROL → PANEL
  Y/C DLY → 800 PRESET
  SYNC PH → 80
  SC PH → 80

5. Setup menu setting

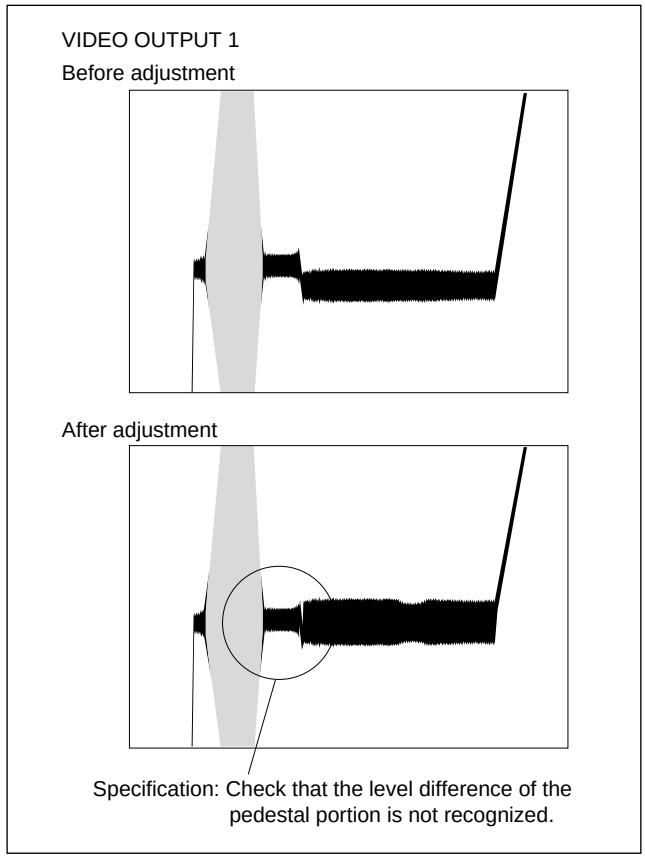
(Regarding the setup menu setting, refer to Section 1-19, or Section 6 of operation manual.)

ITEM-713 : VIDEO SETUP REFERENCE LEVEL
SUB-ITEM 0 : MASTER LEVEL → 0.0 %
1 : INPUT LEVEL → MSTER
2 : INPUT VBLK CNT → THROU
3 : BETACAM PB LEVEL → MSTER
4 : OUTPUT LEVEL → MSTER

9-8-2. Pedestal level Adjustment (525/60 system)

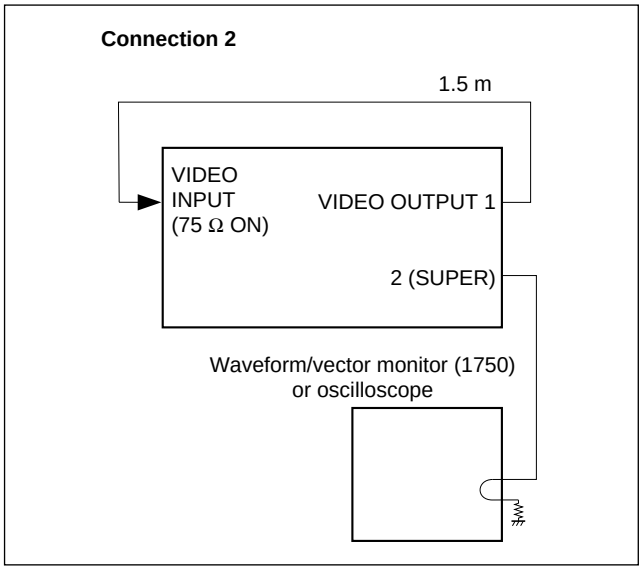


1. Connect equipment as shown in Connection 1.
2. Supply the lamp signal from the signal generator.
3. Observe the burst signal portion of VIDEO OUTPUT 1 output on the waveform monitor or oscilloscope.
   Setting of measurement equipment
   - Waveform monitor
     SWEEP : 1 H, MAG
     GAIN : ×5
     UNCAL : MAX
   - Oscilloscope
     CH-1 : DC 0.5 mV/DIV, 2 µs/DIV
     20 MHz BW LIMIT : ON
4. Activate the maintenance mode.
   (Refer to Section 9-1-1.)
5. Select A25 : DEC VR of A2 : AUDIO/VIDEO ADJUST of the maintenance mode.
6. Select “PEDESTAL”.
7. Adjust “PEDESTAL” so that the specification is satisfied.


VIDEO OUTPUT 1
Before adjustment
After adjustment
Specification: Check that the level difference of the pedestal portion is not recognized.

8. After completing the adjustment, press the MENU button once to exit from A25 : DEC VR.
9. Saving data
   Select A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA.”
10. Check that the message “Save Complete” is displayed on the monitor.
11. Press the MENU button once to exit from A2F : NV-RAM CONTROL.

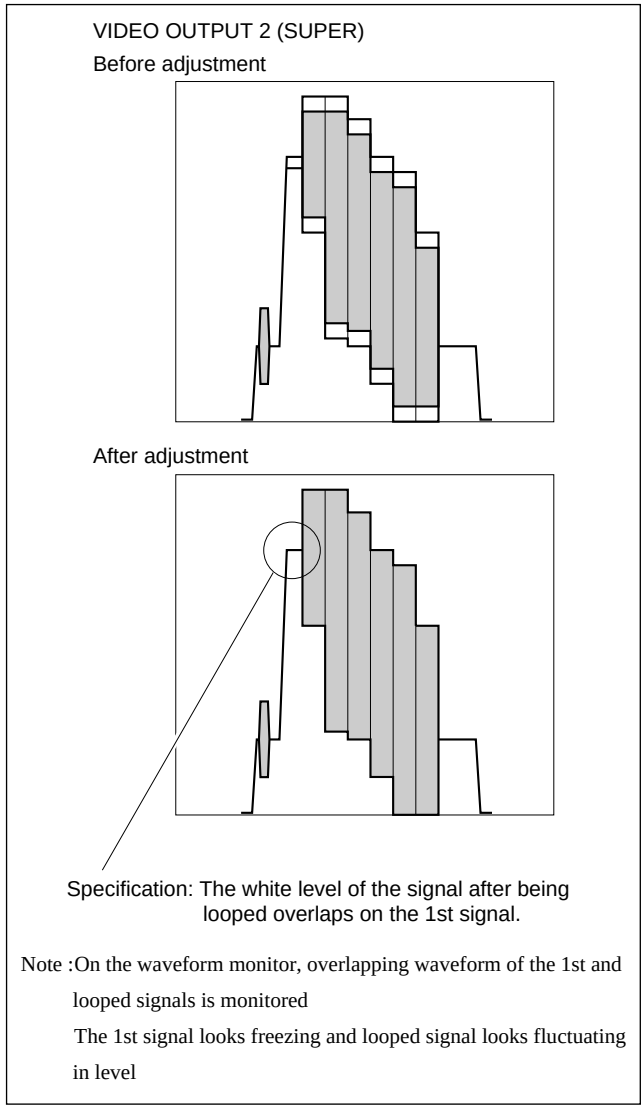
9-8-3. Analog Composite Input Level Adjustment (525/60 system)



1. Connect equipment as shown in Connection 2.
2. Active the maintenance mode.
   (Refer to Section 9-1-1.)
3. Select A26 : DEC VR (LOOP) of A2 : AUDIO/ VIDEO ADJUST of the maintenance mode.
4. Select “VIDEO GAIN.”

   Note

   A 100 % color bars signal is output from the video test signal generator in this unit.
5. Set “SUPER” in sub menu to OFF.
   (Refer to the operation manual, Section 2-9.)
6. Adjust “VIDEO GAIN” so that the specification is satisfied. Be sure to check the data value by the FL display panel.

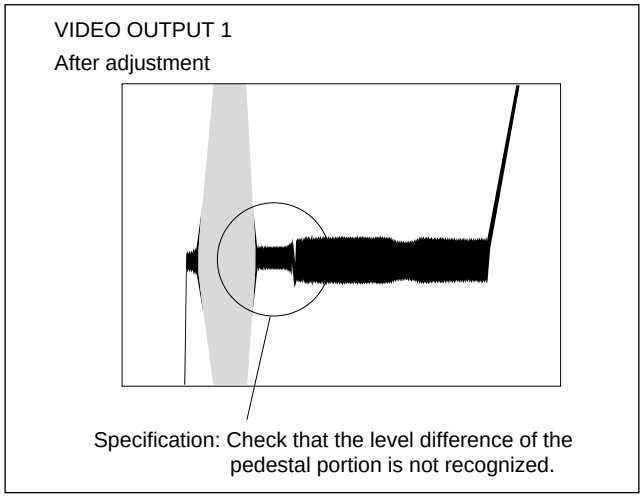

VIDEO OUTPUT 2 (SUPER)
Before adjustment
After adjustment
Specification: The white level of the signal after being looped overlaps on the 1st signal.
Note :On the waveform monitor, overlapping waveform of the 1st and looped signals is monitored
The 1st signal looks freezing and looped signal looks fluctuating in level

7. Set “SUPER” in sub menu to ALL/MENU.
   (Refer to the operation manual, Section 2-9.)
8. After completing the adjustment, press the MENU button once to exit from A26 : DEC VR (LOOP).
9. Saving data
   Select A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA.”
10. Check that the message “Save Complete” is displayed on the monitor.
11. Press the MENU button once to exit from A2F : NV-RAM CONTROL.

9-8-4. Pedestal Level Check (525/60 system)

Check the pedestal level after completing up to Section 9-8-3. “Analog Composite Input Level Adjustment”.

1. Connect equipment as shown in Connection 1 of Section 9-8-2.
2. Supply the lamp signal from the signal generator.
3. Observe the burst signal portion of VIDEO OUTPUT 1 output with the waveform monitor or oscilloscope.
   Setting of measurement equipment
   - Waveform monitor
     SWEEP : 1 H, MAG
     GAIN : ×5
     UNCAL : MAX
   - Oscilloscope
     CH-1 : DC 0.5 mV/DIV, 2 µs/DIV
     20 MHz BW LIMIT : ON
4. Check that the waveform of the pedestal portion satisfies the specification.


VIDEO OUTPUT 1
After adjustment
Specification: Check that the level difference of the pedestal portion is not recognized.

5. When the specification is not satisfied, perform Section 9-8-2. “Pedestal Level Adjustment” again.

9-8-5. Composite Input Color Frame Detect Adjustment (525/60 system)

Note

Check that the video output SCH from the test signal generator is within 0 ±5°.

1. Connect equipment as shown in Connection 1 of Section 9-8-2.
2. Active the maintenance mode.
   (Refer to Section 9-1-1.)
3. Select A2 : AUDIO/VIDEO ADJUST.
4. Select A24 : INPUT CF DETECT.
5. Select “AUTO”. = Press the SET button to execute the auto adjustment.
6. Check that the message “Adjust Complete” is displayed on the monitor after completing the adjustment.
7. Saving data
   Select A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA.”
8. Check that the message “Save Complete” is displayed on the monitor.
9. Press the MENU button once to exit from A2F : NV-RAM CONTROL.
10. Press the MENU button three times to exit from the maintenance mode.

9-8-6. Switching to 625/50 System

1. Video System Setting

Set the unit to 625/50 system with setup menu ITEM-013.
(Refer to Section 1-19-3.)

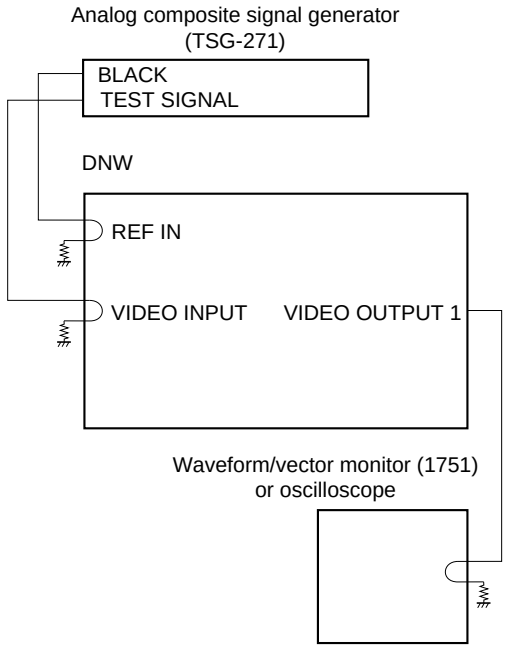
2. Sub menu Setting

(Regarding the sub menu setting, refer to section 2 of operation manual.)

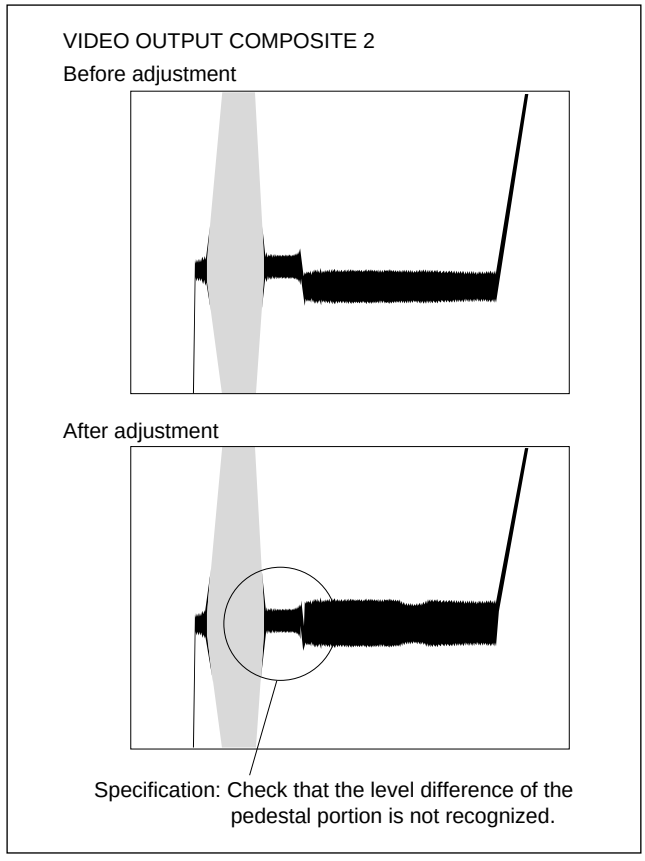
- Home page
  VIDEO INPUT → CMPST
- General setting page
  SUPER → ON
- Video setting page
  PROCESS CONTROL → PANEL
  Y/C DLY → 800 PRESET
  SYNC PH → 80
  SC PH → 80

9-8-7. Pedestal level Adjustment (625/50 system)

Connection 3



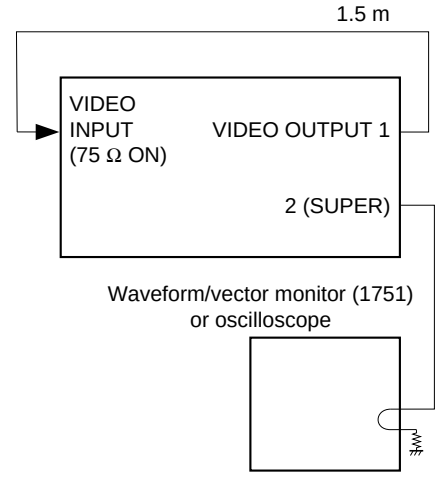
1. Connect equipment as shown in Connection 3.
2. Supply the lamp signal from the signal generator.
3. Observe the burst signal portion of VIDEO OUTPUT 1 output on the waveform monitor or oscilloscope.
   Setting of measurement equipment
   - Waveform monitor
     SWEEP : 1 H, MAG
     GAIN : ×5
     UNCAL : MAX
   - Oscilloscope
     CH-1 : DC 0.5 mV/DIV, 2 µs/DIV
     20 MHz BW LIMIT : ON
4. Activate the maintenance mode.
   (Refer to Section 9-1-1.)
5. Select A25 : DEC VR of A2 : AUDIO/VIDEO ADJUST of the maintenance mode.
6. Select “PEDESTAL.”
7. Adjust “PEDESTAL” so that the specification is satisfied.


VIDEO OUTPUT COMPOSITE 2
Before adjustment
After adjustment
Specification: Check that the level difference of the pedestal portion is not recognized.

8. After completing the adjustment, press the MENU button once to exit from A25 : DEC VR.
9. Saving data
   Select A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA.”
10. Check that the message “Save Complete” is displayed on the monitor.
11. Press the MENU button once to exit from A2F : NV-RAM CONTROL.

9-8-8. Analog Composite Input Level Adjustment (625/50 system)

Connection 4



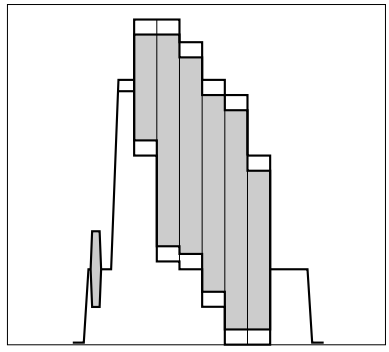
1. Connect equipment as shown in Connection 4.
2. Active the maintenance mode.
   (Refer to Section 9-1-1.)
3. Select A26 : DEC VR (LOOP) of A2 : AUDIO/ VIDEO ADJUST of the maintenance mode.
4. Select “VIDEO GAIN”.

   Note

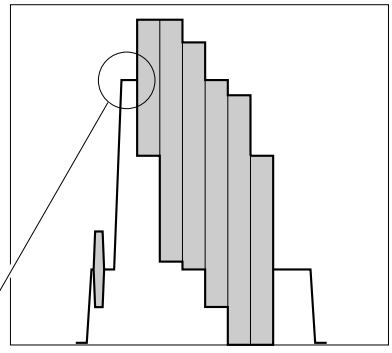
   A 100 % color bars signal is output from the video test signal generator in this unit.
5. Set “SUPER” in sub menu to OFF.
   (Refer to the operation manual, Section 2-9.)
6. Adjust “VIDEO GAIN” so that the specification is satisfied. Be sure to check the data value by the FL display panel.

VIDEO OUTPUT 2 (SUPER)

Before adjustment



After adjustment



Specification: The white level of the signal after being looped overlaps on the 1st signal.

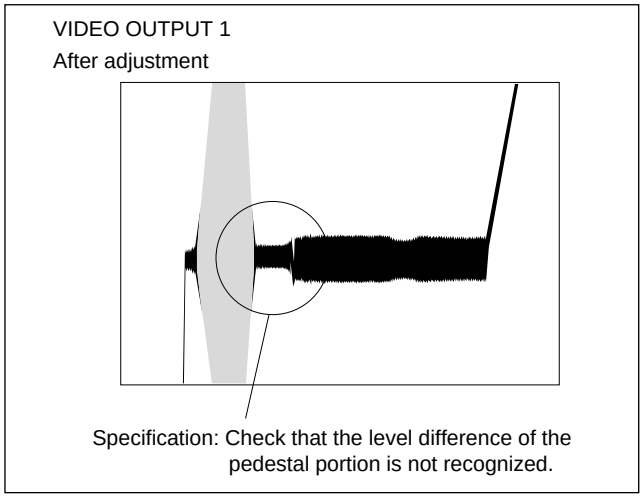
Note :On the waveform monitor, overlapping waveform of the 1st and looped signals is monitored
The 1st signal looks freezing and looped signal looks fluctuating in level.

7. Set “SUPER” in sub menu to ALL/MENU.
   (Refer to the operation manual, Section 2-9.)
8. After completing the adjustment, press the MENU button once to exit from A26 : DEC VR (LOOP).
9. Saving data
   Select A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA.”
10. Check that the message “Save Complete” is displayed on the monitor.
11. Press the MENU button once to exit from A2F : NV-RAM CONTROL.

9-8-9. Pedestal Level Check (625/50 system)

Check the pedestal level after completing up to Section 9-8-8. “Analog Composite Input Level Adjustment.”

1. Connect equipment as shown in Connection 3 of Section 9-8-7.
2. Supply the lamp signal from the signal generator.
3. Observe the burst signal portion of VIDEO OUTPUT 1 output with the waveform monitor or oscilloscope.
   Setting of measurement equipment
   - Waveform monitor
     SWEEP : 1 H, MAG
     GAIN : ×5
     UNCAL : MAX
   - Oscilloscope
     CH-1 : DC 0.5 mV/DIV, 2 µs/DIV
     20 MHz BW LIMIT : ON
4. Check that the waveform of the pedestal portion satisfies the specification.


VIDEO OUTPUT 1
After adjustment
Specification: Check that the level difference of the pedestal portion is not recognized.

5. When the specification is not satisfied, perform Section 9-8-7. “Pedestal Level Adjustment” again.

9-8-10. Composite Input Color Frame Detect Adjustment (625/50 system)

Note

Check that the video output SCH from the test signal generator is within 0 ±5°.

1. Connect equipment as shown in Connection 3 of Section 9-8-7.
2. Active the maintenance mode.
   (Refer to Section 9-1-1.)
3. Select A2 : AUDIO/VIDEO ADJUST.
4. Select A24 : INPUT CF DETECT.
5. Select “AUTO”. = Press the SET button to execute the auto adjustment.
6. Check that the message “Adjust Complete” is displayed on the monitor after completing the adjustment.
7. Saving data
   Select A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA.”
8. Check that the message “Save Complete” is displayed on the monitor.
9. Press the MENU button once to exit from A2F : NV-RAM CONTROL.
10. Press the MENU button three times to exit from the maintenance mode.

11. Return all the settings established in Section 9-8-1 “Preparation” to their normal status.

9-9. Analog Betacam Playback Adjustment

The NV-RAMs (IC909, IC1812) on the DM-114/114P board are storing adjustment data for the DM-114/114P. After replacing each NV-RAM, adjustments are required for each. (Adjustment items 1 through 16 for IC909, and 1, 19, 20 and 23 for IC1812). After replacing the DM-114/114P board itself, be sure to perform adjustments for the following all items.

Adjustment Items

No.	Item			Adjustment point	Remarks
1	Preparation				
2	EQ RF output level adjustment				
			METAL Y	A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP101/DM-114
			METAL C	A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP301/DM-114
			OXIDE C	A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP301/DM-114
			OXIDE Y	A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP101/DM-114
			Saving data	A3F : NV-RAM CONTROL	
3	Cosine equalizer adjustment				
		METAL Y	Group delay	⊘RV101/DM-114, ⊘RV102/DM-114	TP105/DM-114
			Main	A33 : DM VR 2 : MAIN METAL-Y-A A33 : DM VR 2 : MAIN METAL-Y-B	TP107/DM-114
			Sub	A34 : DM VR 3 : SUB METAL-Y-A A34 : DM VR 3 : SUB METAL-Y-B	DNW-A28P : TP106/DM-114
		METAL C	Group delay	⊘RV301/DM-114, ⊘RV302/DM-114	TP305/DM-114
			Main	A33 : DM VR 2 : MAIN METAL-C-A A33 : DM VR 2 : MAIN METAL-C-B	TP307/DM-114
			Sub	A34 : DM VR 3 : SUB METAL-C-A A34 : DM VR 3 : SUB METAL-C-B	DNW-A28P : TP306/DM-114
		OXIDE C	Group delay	⊘RV303/DM-114, ⊘RV304/DM-114	TP305/DM-114
			Main	A33 : DM VR 2 : MAIN OXIDE-C-A A33 : DM VR 2 : MAIN OXIDE-C-B	TP307/DM-114
			Sub	A34 : DM VR 3 : SUB OXIDE-C-A A34 : DM VR 3 : SUB OXIDE-C-B	TP306/DM-114
		OXIDE Y	Group delay	⊘RV104/DM-114	TP105/DM-114
			Main	A33 : DM VR 2 : MAIN OXIDE-Y-A A33 : DM VR 2 : MAIN OXIDE-Y-B	TP107/DM-114
			Sub	A34 : DM VR 3 : SUB OXIDE-Y-A A34 : DM VR 3 : SUB OXIDE-Y-B	TP106/DM-114
		OMC DC offset		A35 : DM VR 4 : OMC DC METAL-Y	
				A35 : DM VR 4 : OMC DC METAL-C A35 : DM VR 4 : OMC DC OXIDE-Y A35 : DM VR 4 : OMC DC OXIDE-C	
		Data Save		A3F : NV-RAM CONTROL	

OMC; Over-Modulation Compensation circuit

(Continued)

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No.	Item		Adjustment point	Remarks
4	Cosine equalizer adjustment (provisional)			
		Note		
		This section explains a provisional adjustment for cosine equalizer without using a network analyzer, as opposed to the adjustment using the network analyzer described above (No.3). Perform this provisional adjustment only when the network analyzer is not available for an urgent maintenance. Be sure to readjust using the network analyzer at a later date.		
5	DM RF output level pre-adjustment			
		METAL Y	⊘RV111/DM-114	TP107/DM-114
		METAL C	⊘RV311/DM-114	TP307/DM-114
		OXIDE C	⊘RV312/DM-114	TP307/DM-114
		OXIDE Y	⊘RV112/DM-114	TP107/DM-114
6	OMC carrier balance adjustment			
		OXIDE Y	⊘RV107/DM-114, ⊘RV108/DM-114	TP111/DM-114
		OXIDE C	⊘RV307/DM-114, ⊘RV308/DM-114	TP309/DM-114
		METAL C	⊘RV305/DM-114, ⊘RV306/DM-114	TP309/DM-114
		METAL Y	⊘RV105/DM-114, ⊘RV106/DM-114	TP111/DM-114
7	OMC carrier balance adjustment (provisional)			
		Note		
		This section explains a provisional adjustment for OMC carrier balance without using a spectrum analyzer, as opposed to the adjustment using the spectrum analyzer described above (No.6). Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. Be sure to readjust using the spectrum analyzer at a later date.		
8	Demodulator limiter balance adjustment			
		Y	⊘RV502/DM-114	TP502/DM-114
		C	⊘RV702/DM-114	TP1201/DM-114
9	Non-liner output level adjustment			
		METAL Y	⊘RV503/DM-114	TP506/DM-114
		METAL C	⊘RV703/DM-114P *	TP706/DM-114P (For DNW-A28P)
		C	⊘RV704/DM-114	TP706/DM-114 (For DNW-A28)
		OXIDE C	⊘RV704/DM-114P	TP706/DM-114P (For DNW-A28P)
		OXIDE Y	⊘RV504/DM-114	TP506/DM-114
10	PB frequency response adjustment			
		METAL Y	A32 : DM VR 1 : EQ1 METAL-Y-A A32 : DM VR 1 : EQ1 METAL-Y-B	SDI OUTPUT (Y CH)
		METAL C	A32 : DM VR 1 : EQ1 METAL-C-A A32 : DM VR 1 : EQ1 METAL-C-B	SDI OUTPUT (R-Y/B-Y CH)
		OXIDE Y	A32 : DM VR 1 : EQ1 OXIDE-Y-A A32 : DM VR 1 : EQ1 OXIDE-Y-B	SDI OUTPUT (Y CH)
		OXIDE C	A32 : DM VR 1 : EQ1 OXIDE-C-A A32 : DM VR 1 : EQ1 OXIDE-C-B	SDI OUTPUT (R-Y/B-Y CH)
		Saving data	A3F : NV-RAM CONTROL	

* RV703 is provided only for DNW-A28P.

(Continued)

(Continued)

No.	Item	Adjustment point		Remarks
11	Dropout compensation equalizer adjustment			
		METAL Y	⊘RV109/DM-114	TP113/DM-114
		METAL C	⊘RV309/DM-114	TP312/DM-114
		OXIDE Y	⊘RV110/DM-114	
		OXIDE C	⊘RV310/DM-114	
12	DM RF output level adjustment			
		METAL Y	⊘RV111/DM-114	TP107/DM-114
		METAL C	⊘RV311/DM-114	TP307/DM-114
		OXIDE C	⊘RV312/DM-114	TP307/DM-114
		OXIDE Y	⊘RV112/DM-114	TP107/DM-114
13	RF envelope adjustment			
		Y	⊘RV113/DM-114	TP113/DM-114
		C	⊘RV313/DM-114	TP312/DM-114
		TH H level	A36 : DM VR 5 : ENV-TH-H	
		TH L level	A36 : DM VR 5 : ENV-TH-L	
		Data save	A3F : NV-RAM CONTROL	
14	Search picture adjustment			
		Offset	⊘RV505/DM-114	TP508/DM-114
		Y	⊘RV501/DM-114	TP503/DM-114
		C	⊘RV701/DM-114	TP703/DM-114
		Gain	⊘RV506/DM-114	TP1101/DM-114
15	Guardband width adjustment			
		METAL	A35 : DM VR 4 : GUARD BAND METAL-Y A35 : DM VR 4 : GUARD BAND METAL-C	
		OXIDE	A35 : DM VR 4 : GUARD BAND OXIDE-Y A35 : DM VR 4 : GUARD BAND OXIDE-C	
		Data save	A3F : NV-RAM CONTROL	
16	SDI output level adjustment			
		METAL Y	⊘RV1101/DM-114	SDI OUTPUT (Y CH)
		METAL C	⊘RV1201/DM-114	SDI OUTPUT (R-Y/B-Y CH)
		OXIDE Y	⊘RV504/DM-114	SDI OUTPUT (Y CH)
		OXIDE C	⊘RV704/DM-114	SDI OUTPUT (R-Y/B-Y CH) (For DNW-A28P)

(Continued)

(Continued)

No.	Item	Adjustment point		Remarks
17	VCO lock-in range adjustment			
		Y	⊘LV1401/DM-114	TP1401/DM-114
		C	⊘LV1601/DM-114	TP1601/DM-114
18	VCO free-run adjustment			
		Y DO	⊘RV1402/DM-114	Video monitor
		C DO	⊘RV1605/DM-114	
19	PB video phase adjustment		⊘RV1401/DM-114 A37 : TBC VR : SQ Y RZ	VIDEO OUTPUT 1
20	TBC Y/C delay pre-adjustment			
		METAL	⊘RV1606/DM-114 ⊘RV1605/DM-114 ⊘RV1601/DM-114 A37 : TBC VR : SQ C RZ ⊘RV1602/DM-114	SDI OUTPUT
21	Impact error offset adjustment			
		Y	⊘RV1301/DM-114	Video monitor
		C	⊘RV1501/DM-114	
22	TBC Y/C delay adjustment			
		METAL	⊘RV1601/DM-114 ⊘RV1602/DM-114	SDI OUTPUT
		OXIDE	⊘RV1603/DM-114 ⊘RV1604/DM-114	SDI OUTPUT
23	VISC phase adjustment		⊘RV1801/DM-114 A37 : TBC VR : VISC PHASE	VIDEO OUTPUT 1
		Data save	A3F : NV-RAM CONTROL	

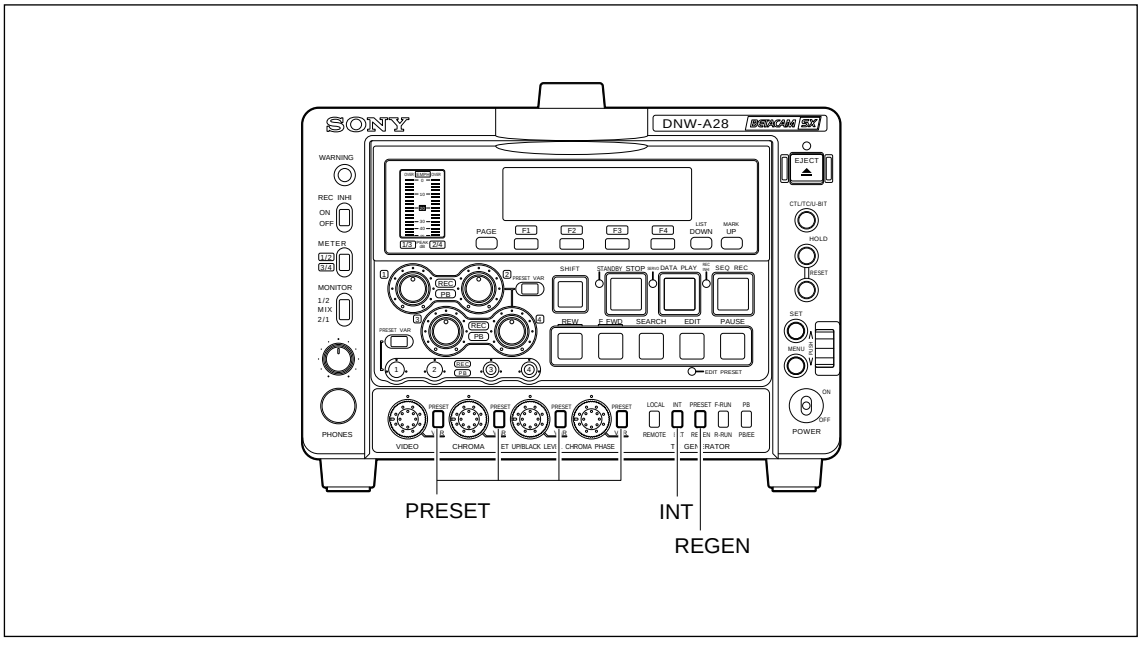
9-9-1. Preparation

Make a photocopy of check sheets given in the Appendix A and write down setup conditions in the check sheets.

1. Setting of S201/SY-259B board

S201-1, 2 (B-1) → ON

2. Front Panel setting



3. Default Setting

Default setting is not necessary to perform except below.

Setting/adjustment required after replacing IC909

- For DNW-A28
  1. Set the unit to 625/50 system with setup menu ITEM-013. (Refer to Section 1-19-3.)
  2. Set the default setting of A32 through A36 with maintenance mode and save the data. (Refer to Section 3-2-9.)
  3. Switch the unit to 525/60 system by selecting the setup menu ITEM-013 and then set the default for each item of the maintenance mode A32 to A36 and save the data.
  4. After making settings described in steps 4 (video system setting) and later, perform adjustments from Sections 9-9-2 to 9-9-16.
- For DNW-A28P
  1. Set the unit to 525/60 system with setup menu ITEM-013. (Refer to Section 1-19-3.)
  2. Set the default setting of A32 through A36 with maintenance mode and save the data. (Refer to Section 3-2-9.)
  3. Switch the unit to 625/50 system by selecting the setup menu ITEM-013 and then set the default for each item of the maintenance mode A32 to A36 and save the data.
  4. After making settings described in steps 4 (video system setting) and later, perform adjustments from Sections 9-9-2 to 9-9-16.

Setting/adjustment required after replacing IC1812

- For DNW-A28
  1. Set the unit to 625/50 system with setup menu ITEM-013. (Refer to Section 1-19-3.)
  2. Set the default setting of A37 with maintenance mode and save the data. (Refer to Section 3-2-9.)
  3. Switch the unit to 525/60 system by selecting the setup menu ITEM-013 and then set the default for each item of the maintenance mode A37 and save the data.
  4. After making settings described in steps 4 (video system setting) and later, confirm that the specifications in Sections 9-9-19, 9-9-20 and 9-9-23 are satisfied.
- For DNW-A28P
  1. Set the unit to 525/60 system with setup menu ITEM-013. (Refer to Section 1-19-3.)
  2. Set the default setting of A32 through A36 with maintenance mode and save the data. (Refer to Section 3-2-9.)
  3. Switch the unit to 625/50 system by selecting the setup menu ITEM-013 and then set the default for each item of the maintenance mode A37 and save the data.
  4. After making settings described in steps 4 (video system setting) and later, confirm that the specifications in Sections 9-9-19, 9-9-20 and 9-9-23 are satisfied.

Setting/adjustment required after replacing DM-114/114P board

- For DNW-A28
  1. Set the unit to 625/50 system with setup menu ITEM-013. (Refer to Section 1-19-3.)
  2. Set the default setting of A32 through A37 with maintenance mode and save the data. (Refer to Section 3-2-9.)
  3. Switch the unit to 525/60 system by selecting the setup menu ITEM-013 and then set the default for each item of the maintenance mode A32 to A37 and save the data.
  4. After making settings described in steps 4 (video system setting) and later, perform all adjustments of Sections 9-9-2 and later.
- For DNW-A28P
  1. Set the unit to 525/60 system with setup menu ITEM-013. (Refer to Section 1-19-3.)
  2. Set the default setting of A32 through A37 with maintenance mode and save the data. (Refer to Section 3-2-9.)
  3. Switch the unit to 625/50 system by selecting the setup menu ITEM-013 and then set the default for each item of the maintenance mode A32 to A37 and save the data.
  4. After making settings described in steps 4 (video system setting) and later, perform all adjustments of Sections 9-9-2 and later.

Item of A3 : BETACAM ADJUST		DNW-A28 525/60	DNW-A28 625/50	DNW-A28P 625/50	DNW-A28P 525/60
A32 : DM VR 1	EQ1 METAL-Y-A	85	8A	8F	9C
	EQ1 METAL-Y-B	85	8A	8F	9C
	EQ1 METAL-C-A	74	73	7E	7E
	EQ1 METAL-C-B	74	73	7E	7E
	EQ1 OXIDE-Y-A	AA	A2	9F	A1
	EQ1 OXIDE-Y-B	AA	A2	9F	A1
	EQ1 OXIDE-C-A	A6	96	B1	AA
	EQ1 OXIDE-C-B	A6	96	B1	AA
A33 : DM VR 2	MAIN METAL-Y-A	BF	BF	B4	B4
	MAIN METAL-Y-B	BF	BF	B4	B4
	MAIN METAL-C-A	94	94	94	94
	MAIN METAL-C-B	94	94	94	94
	MAIN OXIDE-Y-A	B3	B3	B4	B4
	MAIN OXIDE-Y-B	B3	B3	B4	B4
	MAIN OXIDE-C-A	A4	A4	A5	A5
	MAIN OXIDE-C-B	A4	A4	A5	A5
A34 : DM VR 3	SUB METAL-Y-A	B0	E0	B5	98
	SUB METAL-Y-B	B0	E0	B5	98
	SUB METAL-C-A	70	70	98	70
	SUB METAL-C-B	70	70	98	70
	SUB OXIDE-Y-A	BC	BC	C9	C9
	SUB OXIDE-Y-B	BC	BC	C9	C9
	SUB OXIDE-C-A	90	90	90	90
	SUB OXIDE-C-B	90	90	90	90
A35 : DM VR 4	GUARD BAND METAL-Y	35	36	36	35
	GUARD BAND METAL-C	29	36	36	29
	GUARD BAND OXIDE-Y	2D	2D	2D	2D
	GUARD BAND OXIDE-C	2E	2E	2E	2E
	OMC DC METAL-Y	E4	E4	E4	E4
	OMC DC METAL-C	D0	D0	D0	D0
	OMC DC OXIDE-Y	D0	D0	D0	D0
	OMC DC OXIDE-C	D0	D0	D0	D0
A36 : DM VR 5	DO TH METAL-Y	0E	17	17	0E
	DO TH METAL-C	0D	14	14	0D
	DO TH OXIDE-Y	25	25	25	25
	DO TH OXIDE-C	25	25	25	25
	ENV-TH-H	20	20	20	20
	ENV-TH-L	10	10	10	10
A37 : TBC VR	SQ Y RZ	45	44	44	45
	SQ C RZ	65	64	64	65
	VISC PHASE	06	06	06	06

4. Video System Setting

(Regarding video system setting, refer to Section 1-19-2.)

- For DNW-A28, confirm that the unit is set to 525/60 system with the setup menu ITEM-013.
- For DNW-A28P, confirm that the unit is set to 625/50 system with the setup menu ITEM-013.

5. Sub menu Setting

(Regarding the sub menu setting, refer to Section 2 of operation manual.)

- General setting page
  SUPER → ON
- Video setting page
  PROCESS CONTROL → PANEL
  Y/C DLY → 800 PRESET
  SYNC PH → 80
  SC PH → 80

6. Setup menu setting

(Regarding the setup menu setting, refer to Section 1-19, or Section 6 of operation manual.)

- For DNW-A28
  ITEM-713 :VIDEO SETUP REFERENCE LEVEL
  SUB-ITEM 0 : MASTER LEVEL → 7.5 %
  1 : INPUT LEVEL → MSTER
  2 : INPUT VBLK CNT → THROU
  3 : BETACAM PB LEVEL → MSTER
  4 : OUTPUT LEVEL → MSTER
- For DNW-A28P
  No setting required

7. Time data display setting

Press the CTL/TC/U-BIT button on the front panel to indicate TC on the display.

8. Setting RV1606

Fully turn RV1606/DM-114 (✻F-5) counterclockwise (↺) in advance.

9-9-2. EQ RF Output Level Adjustment

Note

Allow about a minute after the alignment tape (Betacam cassette) is inserted, then perform the adjustments.

Measuring equipment : Oscilloscope
(20 MHz BW LIMIT : ON)

Preparation/Setting

1. Start up the maintenance mode.
   (Refer to Section 9-1-1.)
2. Select “A30 : EQ VR.”
3. Connect and set the oscilloscope as follows :
   CH-1 : TP112/DM-114 (∗N-4), DC 1 V/DIV
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP101/DM-114 (∗P-4), AC 100 mV/DIV, 2 ms/DIV
   GND : E101/DM-114 (∗P-4)
   Trigger : CH-1

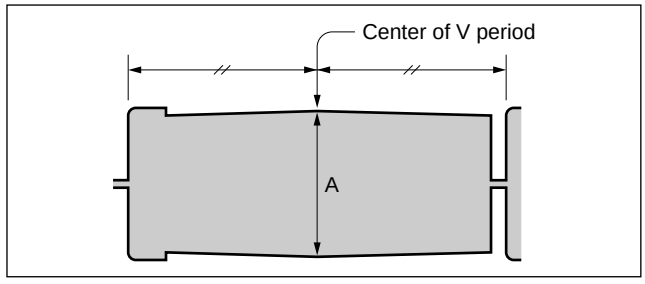
1. METAL Y adjustment

1. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

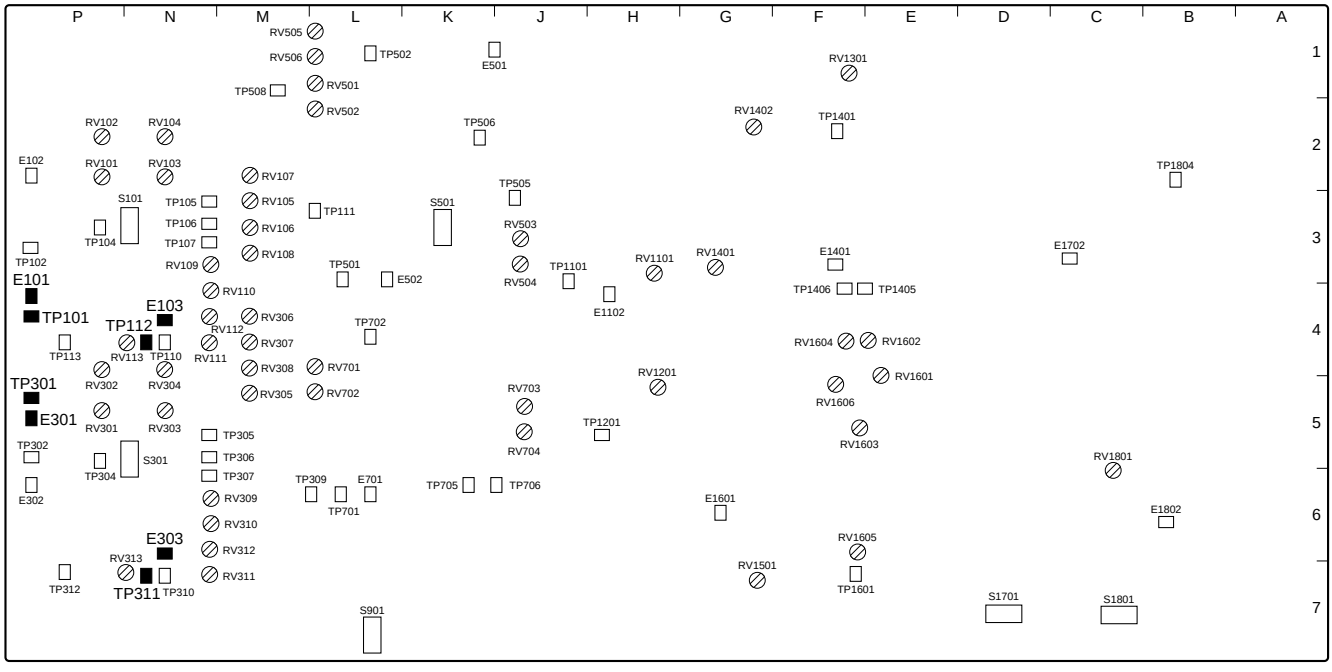
   Notes

   Adjust respectively for Y-A and Y-B channels.
   Observing the Y-A channel, set the trigger of oscilloscope to the negative (−) slope.
   Observing the Y-B channel, set the trigger of oscilloscope to the positive (+) slope.

   Adjustment points :
   Y-A channel : A30 : EQ VR : RF GAIN METAL-Y-A
   Y-B channel : A30 : EQ VR : RF GAIN METAL-Y-B
   Specifications (Y-A and Y-B channels) :
   A = 380 ±20 mV p-p



2. Stop the playback of the alignment tape.



DM-114 Board (B Side)

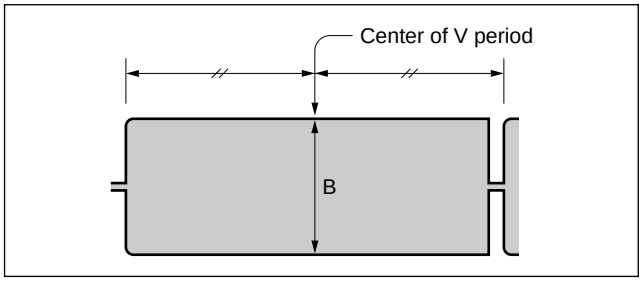
2. METAL C adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP311/DM-114 (∗N-7)
   GND : E303/DM-114 (∗N-6)
   CH-2 : TP301/DM-114 (∗P-5)
   GND : E301/DM-114 (∗P-5)
   Trigger : CH-1
2. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

   Notes

   Adjust respectively for C-A and C-B channels.
   Observing the C-A channel, set the trigger of oscilloscope to the negative (−) slope.
   Observing the C-B channel, set the trigger of oscilloscope to the positive (+) slope.

   Adjustment points :
   C-A channel : A30 : EQ VR : RF GAIN METAL-C-A
   C-B channel : A30 : EQ VR : RF GAIN METAL-C-B
   Specifications (C-A and C-B channels) :
   B = 380 ± 20 mV p-p



3. Eject the alignment tape.

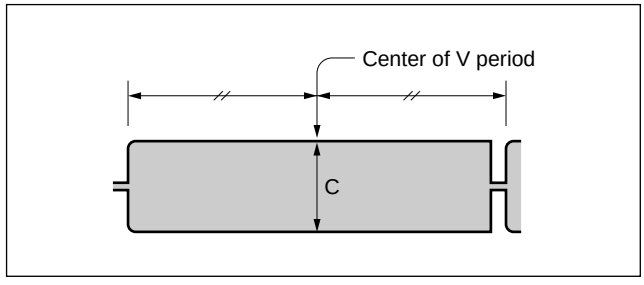
3. OXIDE C adjustment

1. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)

   Note

   Adjust respectively for C-A and C-B channels.
   Observing the C-A channel, set the trigger of oscilloscope to the negative (−) slope.
   Observing the C-B channel, set the trigger of oscilloscope to the positive (+) slope.

   Adjustment points :
   C-A channel : A30 : EQ VR : RF GAIN OXIDE-C-A
   C-B channel : A30 : EQ VR : RF GAIN OXIDE-C-B
   Specifications (C-A and C-B channels) :
   C = 250 ± 20 mV p-p



2. Stop the playback of the alignment tape.

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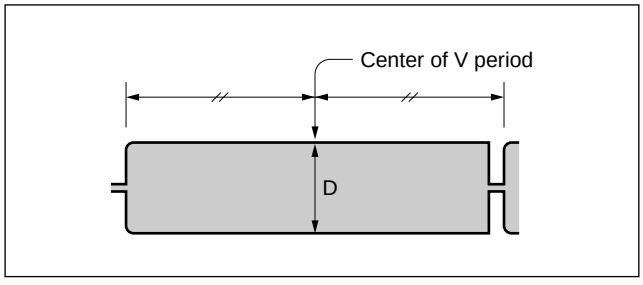
4. OXIDE Y adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP112/DM-114 (∗N-4)
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP101/DM-114 (∗P-4)
   GND : E101/DM-114 (∗P-4)
   Trigger : CH-1
2. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)

   Notes

   Adjust respectively for Y-A and Y-B channels.
   Observing the Y-A channel, set the trigger of oscilloscope to the negative (−) slope.
   Observing the Y-B channel, set the trigger of oscilloscope to the positive (+) slope.

   Adjustment points :
   Y-A channel : A30 : EQ VR : RF GAIN OXIDE-Y-A
   Y-B channel : A30 : EQ VR : RF GAIN OXIDE-Y-B
   Specifications (Y-A and Y-B channels) :
   D = 250 ±20 mV p-p



3. Eject the alignment tape.
4. To exit from A30 : EQ VR, press the MENU button once on the front panel.

5. Saving data

1. Select A3F : NV-RAM CONTROL of the maintenance mode, then execute “SAVE ALL ADJUST DATA”.
2. Check that the message “Save Complete” is displayed on the monitor.
3. To exit from A3F : NV-RAM CONTROL, press the MENU button once.
4. To exit the maintenance mode, press the MENU button three times.

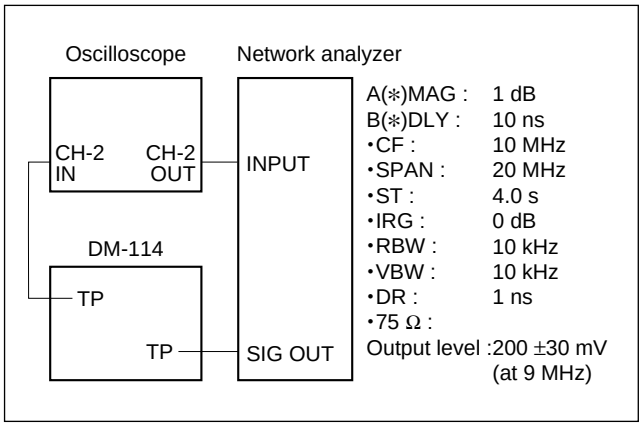
9-9-3. Cosine Equalizer Adjustment

Note

If the network analyzer is not available, perform Section 9-9-4. “Cosine Equalizer Adjustment (Provisional).”

Measuring equipment : Network analyzer and Oscilloscope
(See the figure below)

Preparation/Setting

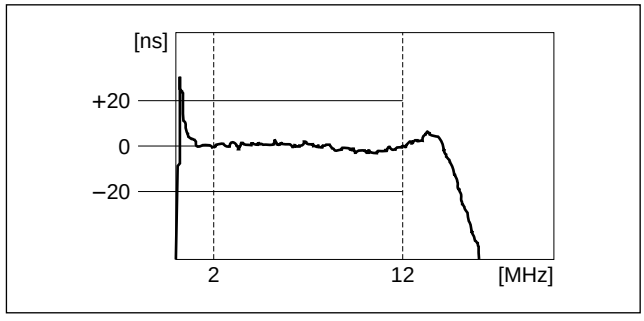


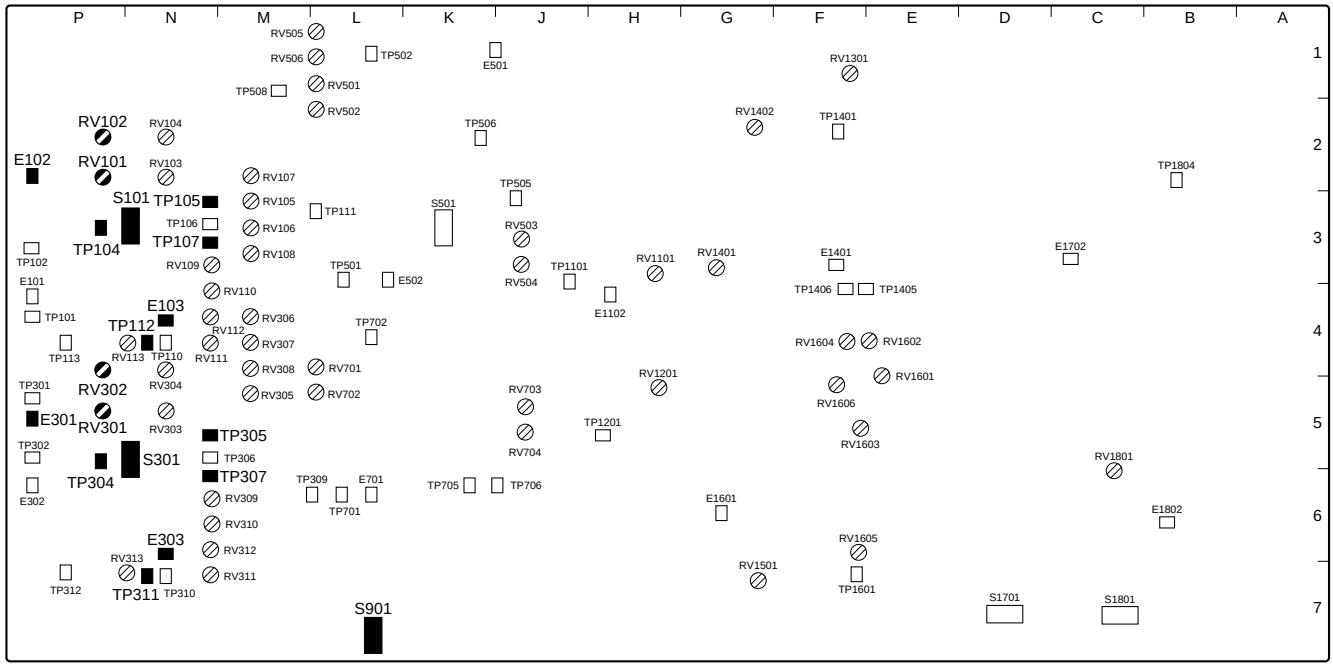
Connection and Setting of Network Analyzer

1. Set S901-1 and S901-3 (∗L-7) on DM-114 board to ON.
2. Set S101 (∗N-3) and S301 (∗N-5) on DM-114 board to TEST side.
3. Insert the alignment tape CR5-1B or CR5-1B PS. (STANDBY OFF mode)
   (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

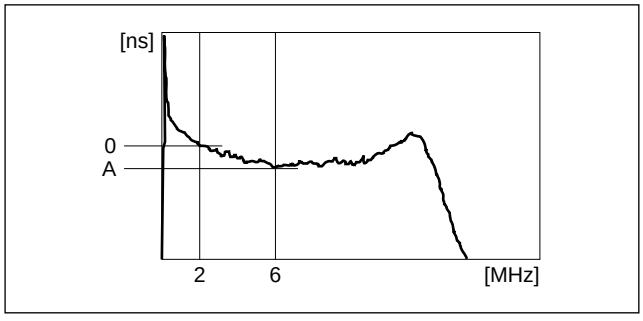
1. METAL Y adjustment

1. Short-circuit between TP112/DM-114 (∗N-4) and E103/DM-114 (∗N-4) with a shorting clip.
2. Connect the output of network analyzer to TP104/DM-114 (∗P-3).
   GND : E102/DM-114 (∗P-2)
3. Connect oscilloscope’s CH-2 to TP105/DM-114 (∗N-3).
   GND : E103/DM-114 (∗N-4)
4. METAL Y, Group delay adjustment
   Adjust the group delay time from 2 MHz to 12 MHz to satisfy the specification.
   Adjustment Point : ⊘RV101/DM-114 (∗P-2) and ⊘RV102/DM-114 (∗P-2)
   Specification : 0 ±20 ns

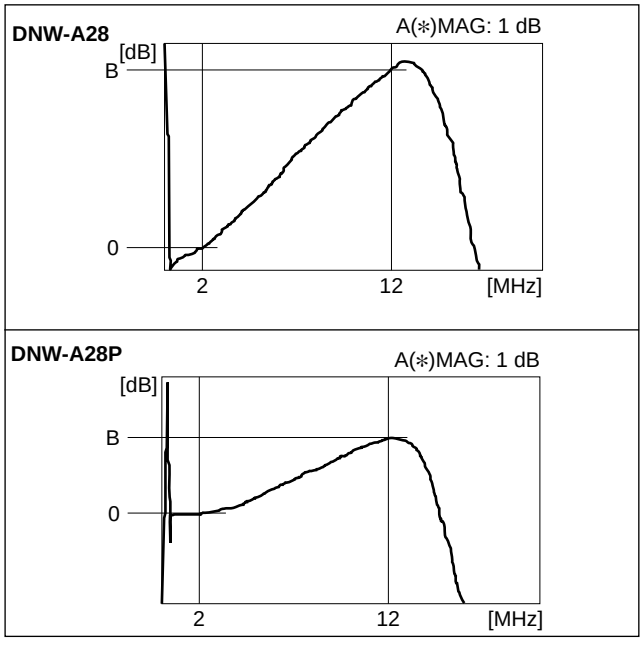




5. For DNW-A28 only
   Adjust the delay time of 6 MHz against 2 MHz until satisfy the specification.
   Adjustment Point : ⊘RV101/DM-114 (∗P-2)
   Specification : A = −10 ± 3 ns

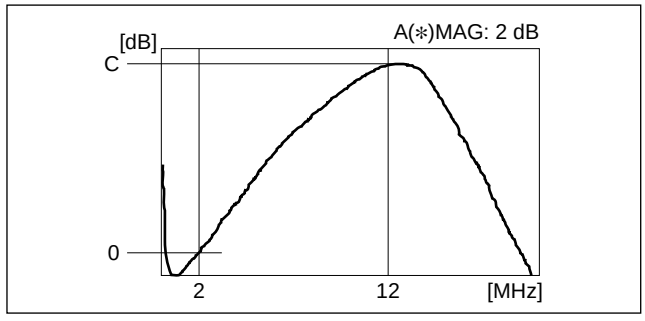


6. Start up the maintenance mode.
   (Refer to Section 9-1-1.)
7. Select "A33 : DM VR 2."
8. Connect oscilloscope's CH-2 to TP107/DM-114 (∗N-3).
   GND : E103/DM-114 (∗N-4)
9. METAL Y, Main adjustment
   (1) Adjust the level difference between 12 MHz and 2 MHz until satisfy the specification.
   Adjustment point :
   A33 : DM VR 2 : MAIN METAL-Y-A
   Specification : DNW-A28 : B = +8.0 ± 0.5 dB
   DNW-A28P : B = +1.5 ± 0.5 dB



   (2) Set the data value of A33 : DM VR 2 : MAIN METAL-Y-B to the identical data value as MAIN METAL-Y-A.

10. To exit from A33 : DM VR 2, press the MENU button once.
11. Select A34 : DM VR 3 of the maintenance mode.
12. METAL Y, Sub adjustment
    For DNW-A28
    Set the data values of A34 : DM VR 3 : SUB METAL-Y-A and SUB METAL-Y-B to B0.
    For DNW-A28P
    (1) Connect oscilloscope's CH-2 to TP106/DM-114 (∗N-3).
    GND : E103/DM-114 (∗N-4)
    (2) Adjust the level difference between 12 MHz and 2 MHz until satisfy the specification.
    Adjustment point :
    A34 : DM VR 3 : SUB METAL-Y-A
    Specification : C = +16.5 ± 1.0 dB

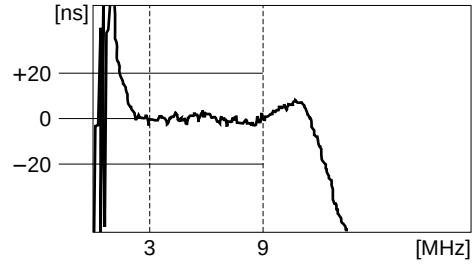


    (3) Set the data value of A34 : DM VR 3 : SUB METAL-Y-A and SUB METAL-Y-B to B0.
13. To exit from A34 : DM VR 3, press the MENU button once.
14. Disconnect the shorting clip from TP112/DM-114 (*N-4).

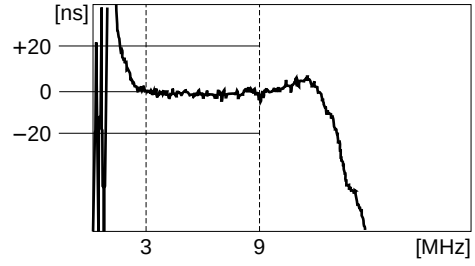
2. METAL C adjustment

1. Short-circuit between TP311/DM-114 (⁎N-7) and E303/DM-114 (⁎N-6) with a shorting clip.
2. Connect the output of network analyzer to TP304/DM-114 (⁎P-5).
   GND : E301/DM-114 (⁎P-5)
3. Connect the oscilloscope's CH-2 to TP305/DM-114 (⁎N-5).
   GND : E303/DM-114 (⁎N-6)
4. METAL C, Group delay adjustment
   Adjust the group delay time from 3 MHz to 9 MHz to satisfy the specification.
   Adjustment points : ◓RV301/DM-114 (⁎P-5) and
   ◓RV302/DM-114 (⁎P-4)
   Specification : 0 ±20 ns
5. Connect the oscilloscope's CH-2 to TP307/DM-114 (⁎N-6).
   GND : E303/DM-114 (⁎N-6)
6. Select A33 : DM VR 2 of the maintenance mode.

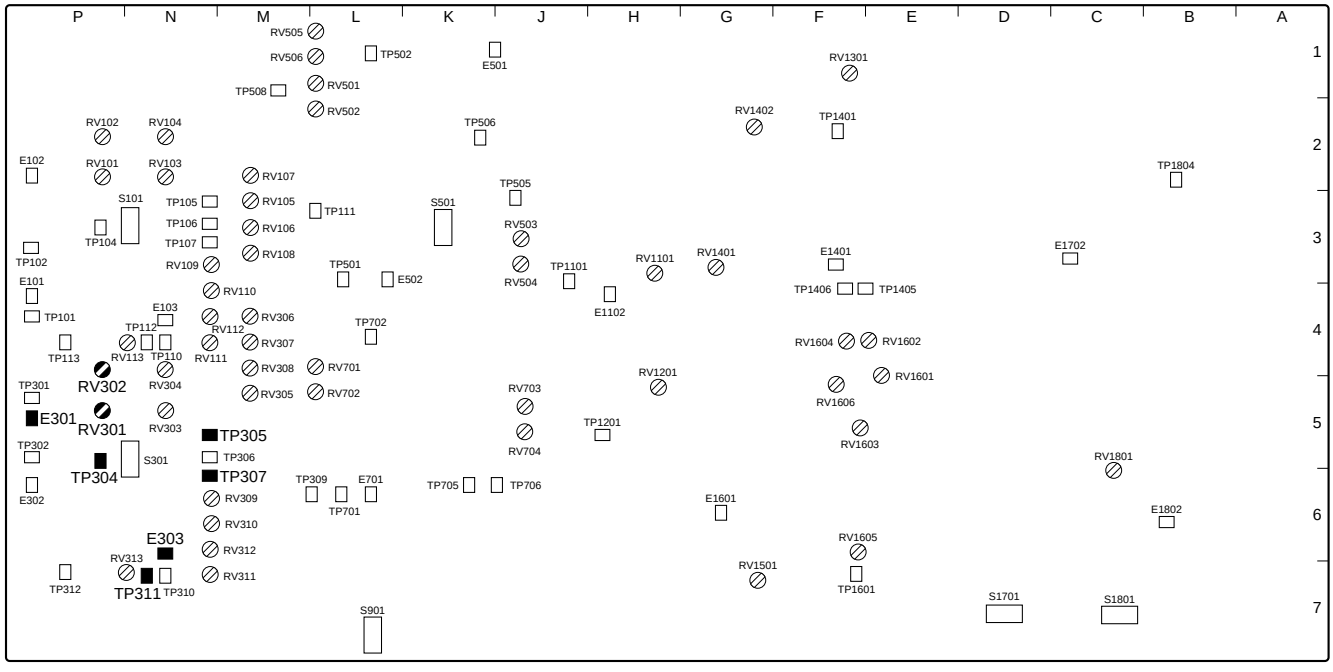
DNW-A28



DNW-A28P



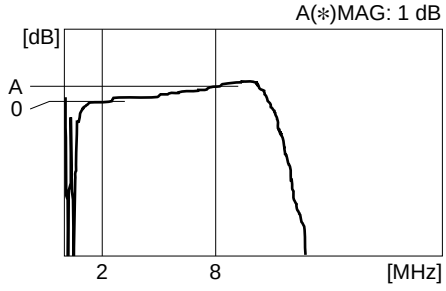
METAL C



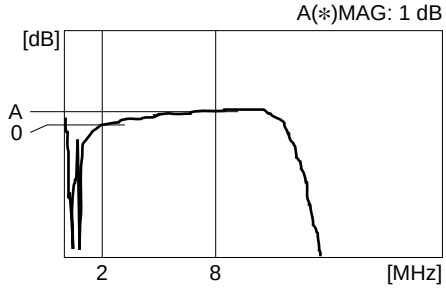
DM-114 Board (B Side)

7. METAL C, Main adjustment
   (1) Adjust the level difference between 8 MHz and 2 MHz until satisfy the specification.
   Adjustment point : A33 : DM VR 2 : MAIN METAL-C-A
   Specification : A = +0.5 ±0.5 dB

DNW-A28



DNW-A28P



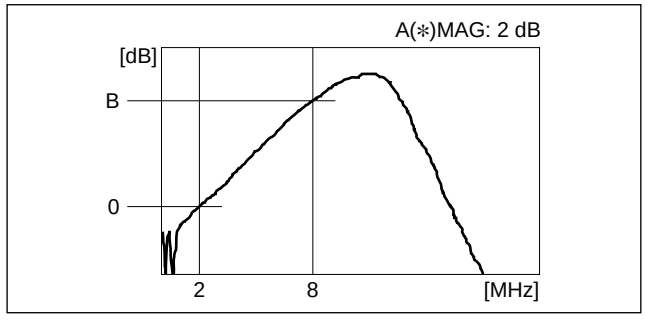
   (2) Set the data value of A33 : DM VR 2 : MAIN METAL-C-B to the identical data value as MAIN METAL-C-A.
8. To exit from A33 : DM VR 2, press the MENU button once.
9. Select A34 : DM VR 3 of the maintenance mode.
10. METAL C, Sub adjustment

For DNW-A28

Set the data value of A34 : DM VR 3 : SUB METAL-C-A and SUB METAL-C-B to 70.

For DNW-A28P

   (1) Connect the oscilloscope's CH-2 to TP306/DM-114 (∗N-5).
   GND : E303/DM-114 (∗N-6)
   (2) Adjust the level difference between 8 MHz and 2 MHz until to satisfy the specification.
   Adjustment point : A34 : DM VR 3 : SUB METAL-C-A
   Specification : B = +9.2 ±1.0 dB

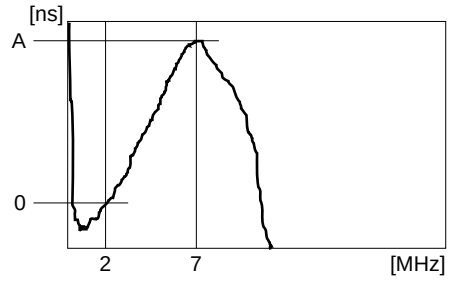


   (3) Set the data value of A34 : DM VR 3 : SUB METAL-C-B to the identical data value as SUB METAL-C-A.
11. Eject the alignment tape.
12. To exit from A34 : DM VR 3, press the MENU button once.

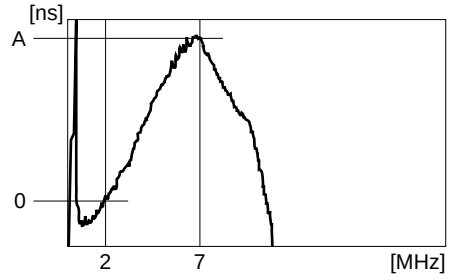
3. OXIDE C adjustment

1. Insert the alignment tape CR5-2A or CR5-2A PS. (STANDBY OFF mode)
   (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
2. Connect the output of network analyzer to TP304/DM-114 (⁎P-5).
   GND : E301/DM-114 (⁎P-5)
3. Connect the oscilloscope's CH-2 to TP305/DM-114 (⁎N-5).
   GND : E303/DM-114 (⁎N-6)
4. OXIDE C, Group delay adjustment
   Adjust the delay time of 7 MHz against 2 MHz until satisfy the specification.
   Adjustment points : ◓RV303/DM-114 (⁎N-5) and
   ◓RV304/DM-114 (⁎N-4)
   Specification : A = 70 ±5 ns

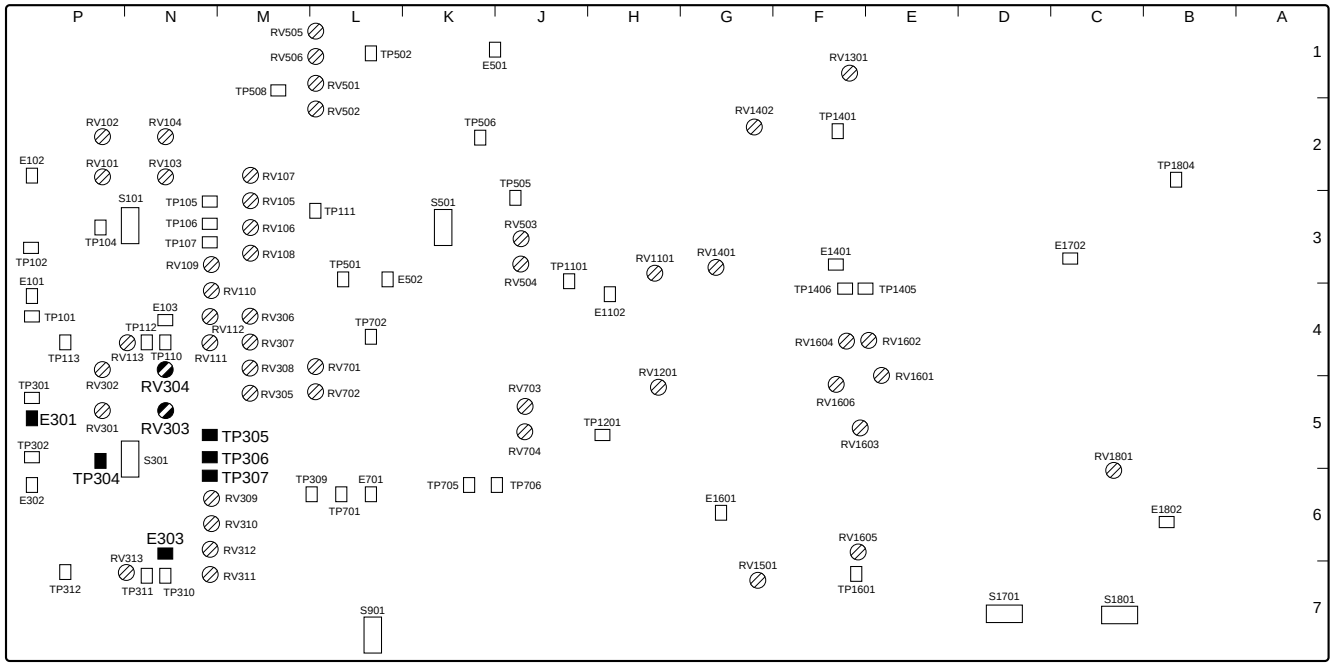
DNW-A28



DNW-A28P

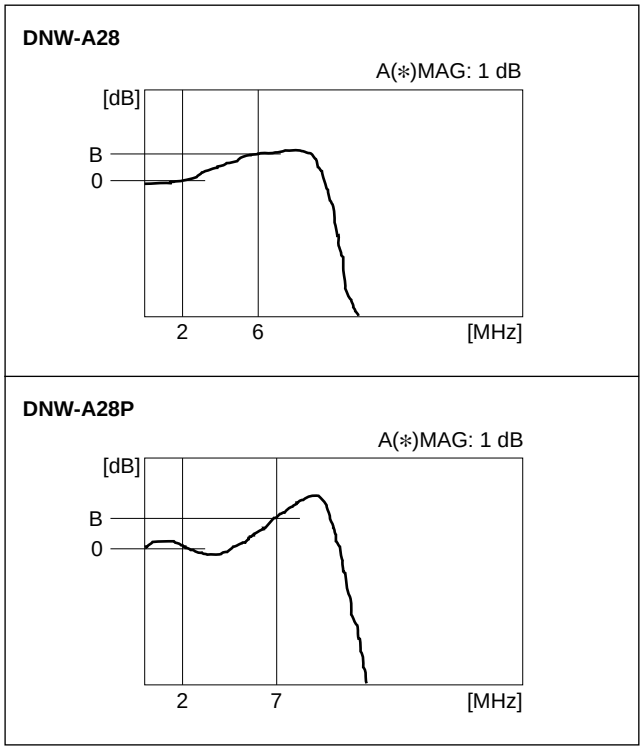


OXIDE C

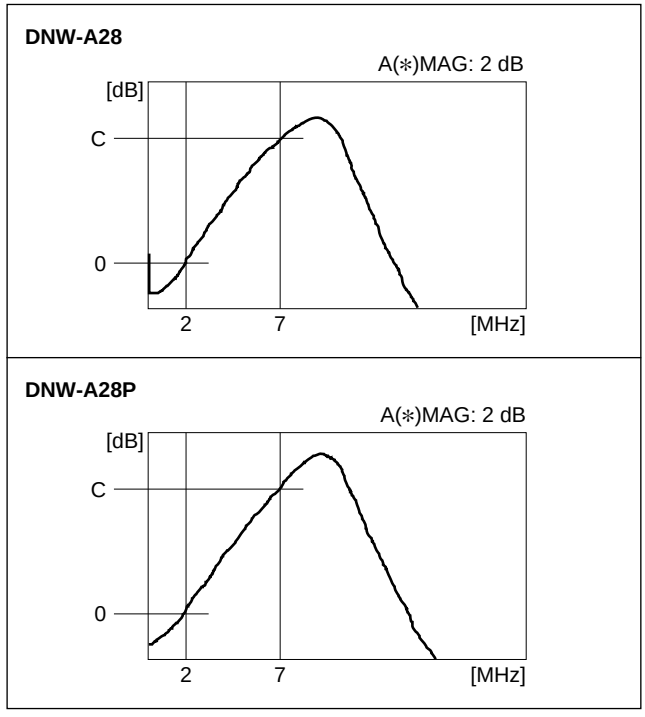


DM-114 Board (B Side)

5. Connect the oscilloscope's CH-2 to TP307/DM-114 (∗N-6).
   GND : E303/DM-114 (∗N-6)
6. Select A33 : DM VR 2 of the maintenance mode.
7. OXIDE C, Main adjustment
   (1) Adjust the level difference between 6 MHz for DNW-A28 (or 7 MHz for DNW-A28P) and 2 MHz until satisfy the specification.
   Adjustment point : A33 : DM VR 2 : MAIN OXIDE-C-A
   Specification : B = +1.2 ± 0.5 dB



   (2) Set the data value of A33 : DM VR 2 : MAIN OXIDE-C-B to the identical data value as MAIN OXIDE-C-A.
8. To exit from A33 : DM VR 2, press the MENU button once.
9. Select A34 : DM VR 3 of the maintenance mode.
10. Connect the oscilloscope's CH-2 to TP306/DM-114 (∗N-5).
    GND : E303/DM-114 (∗N-6)
11. OXIDE C, Sub adjustment
    (1) Adjust the level difference between 7 MHz and 2 MHz until satisfy the specification.
    Adjustment point : A34 : DM VR 3 : SUB OXIDE-C-A
    Specification : C = +11.0 ± 0.5 dB

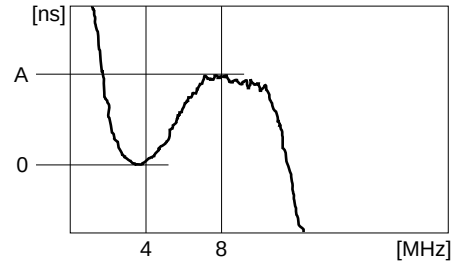


    (2) Set the data value of A34 : DM VR 3 : SUB OXIDE-C-B to the identical data value as SUB OXIDE-C-A.
12. To exit from A34 : DM VR 3, press the MENU button once.
13. Disconnect the shorting clip from TP311/DM-114 (∗N-7).

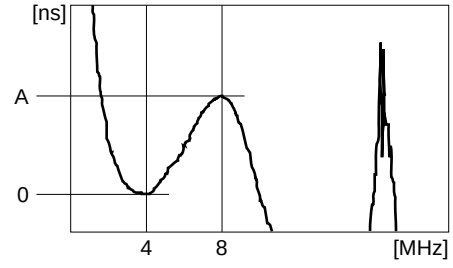
4. OXIDE Y adjustment

1. Short-circuit between TP112/DM-114 (⁎N-4) and E103/DM-114 (⁎N-4) with a shorting clip.
2. Connect the output of network analyzer to TP104/DM-114 (⁎P-3).
   GND : E102/DM-114 (⁎P-2)
3. Connect the oscilloscope's CH-2 to TP105/DM-114 (⁎N-3).
   GND : E103/DM-114 (⁎N-4)
4. OXIDE Y, Group delay adjustment
   Adjust the delay time of 8 MHz against 4 MHz until satisfy the specification.
   Adjustment point : ⊘RV104/DM-114 (⁎N-2)
   Specification : DNW-A28 : A = 40 ± 5 ns
   DNW-A28P : A = 40 ± 3 ns
5. Select A33 : DM VR 2 of the maintenance mode.
6. Connect the oscilloscope's CH-2 to TP107/DM-114 (⁎N-3).
   GND : E103/DM-114 (⁎N-4)

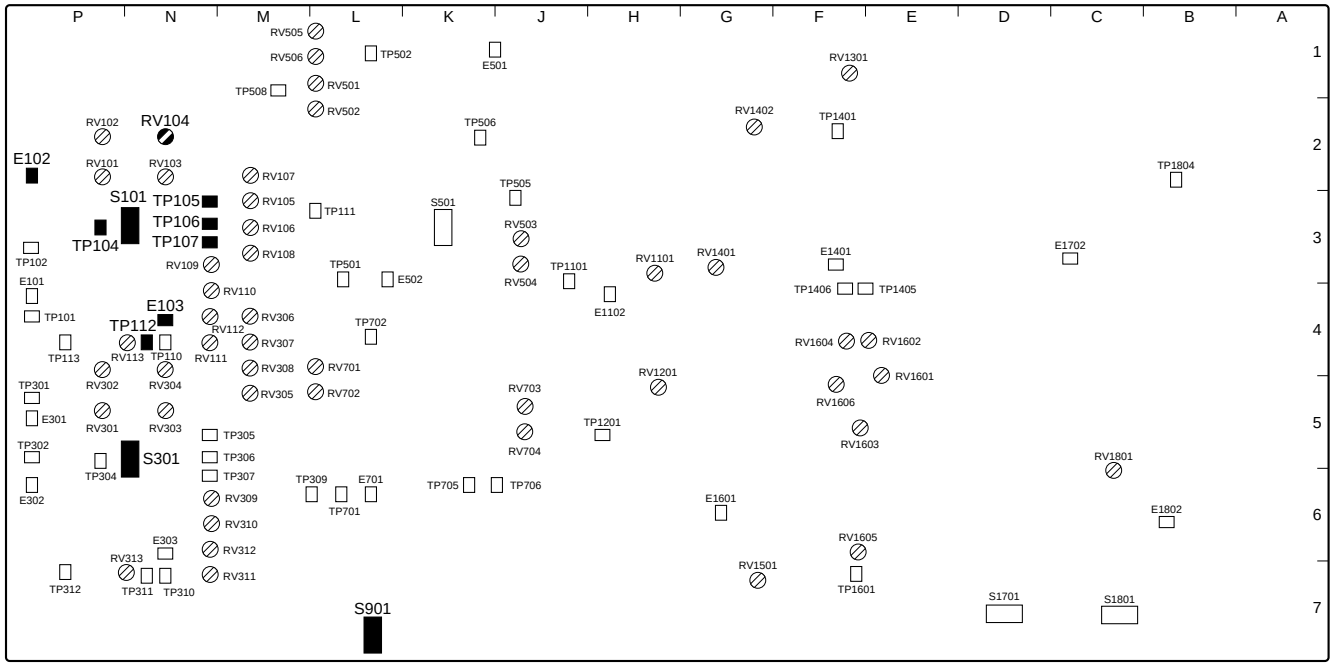
DNW-A28



DNW-A28P

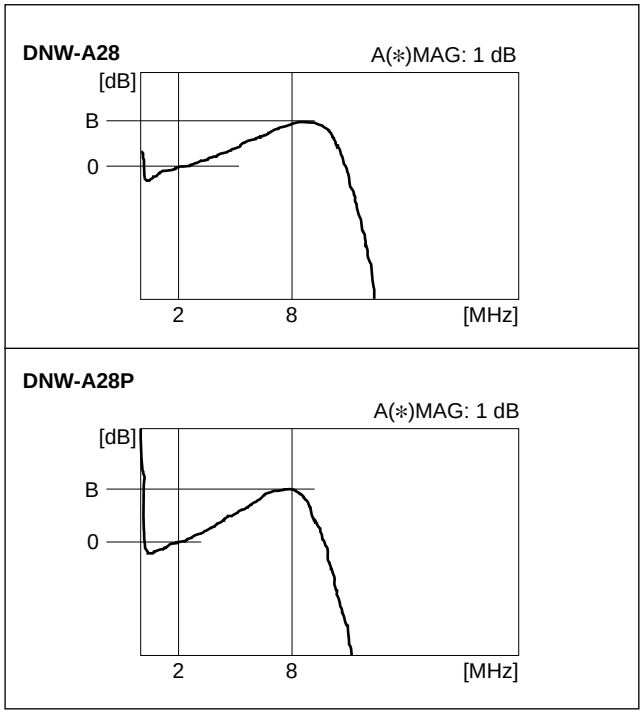


OXIDE Y

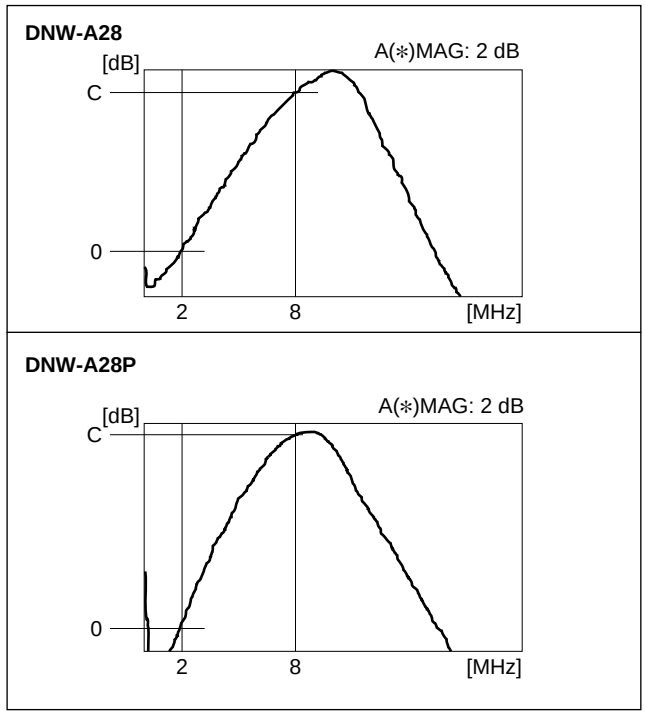


DM-114 Board (B Side)

7. OXIDE Y, Main adjustment
   (1) Adjust the level difference between 8 MHz and 2 MHz until satisfy the specification.
   Adjustment point :
   A33 : DM VR 2 : MAIN OXIDE-Y-A
   Specification : DNW-A28 : B = +2.0 ±0.5 dB
   DNW-A28P : B = +2.5 ±0.5 dB



   (2) Set the data value of A33 : DM VR 2 : MAIN OXIDE-Y-B to the identical data value as MAIN OXIDE-Y-A.
8. To exit from A33 : DM VR 2, press the MENU button once.
9. Select A34 : DM VR 3 of the maintenance mode.
10. Connect the oscilloscope's CH-2 to TP106/DM-114 (∗N-3).
    GND : E103/DM-114 (∗N-4)
11. OXIDE Y, Sub adjustment
    (1) Adjust the level difference between 8 MHz and 2 MHz until satisfy the specification.
    Adjustment point :
    A34 : DM VR 3 : SUB OXIDE-Y-A
    Specification : DNW-A28 : C = +14.0 ±0.5 dB
    DNW-A28P : C = +17.0 ±0.5 dB



   (2) Set the data value of A34 : DM VR 3 : SUB OXIDE-Y-B to the identical data value as SUB OXIDE-Y-A.
12. Eject the alignment tape.
13. To exit from A34 : DM VR 3, press the MENU button once.
14. Disconnect the short clip from TP112/DM-114 (∗N-4) and E103/DM-114 (∗N-4).
15. Reset S101 (∗N-3) and S301 (∗N-5) of DM-114 board to NOR side.
16. Reset S901-1 and S901-3 (∗L-7) of DM-114 board to OFF.

5. Setting of the OMC DC offset

1. Preset and save data of A35 : DM VR4 ; OMC DC referring to Section 9-9-1 Step 3 “Default Setting.”
   Note
   If data setting has been established in Section 9-9-1 “Preparation”, presetting is not required.
2. Confirm that each items of A35 : DM VR 4 is set to initial data (refer to Section 9-9-1. Preparation)
3. To exit from A35 : DM VR 4, press the MENU button.

6. Saving data

1. Select A3F : NV-RAM CONTROL of the maintenance mode, then execute “SAVE ALL ADJUST DATA.”
2. Check that the message “Save Complete” is displayed on the monitor.
3. To exit from A3F : NV-RAM CONTROL, press the MENU button once.

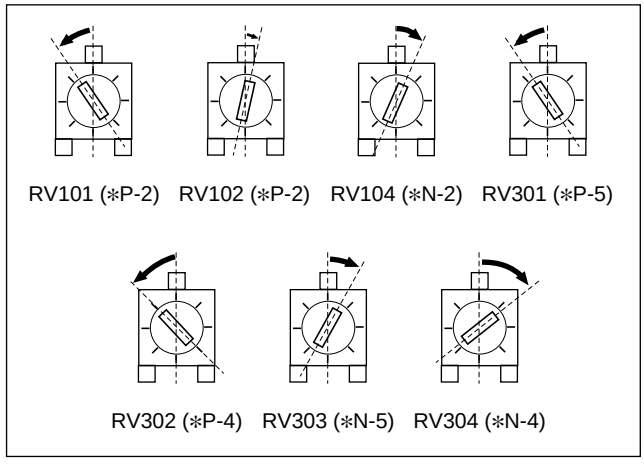
9-9-4. Cosine Equalizer Adjustment (Provisional)

Notes

- This section explains a provisional adjustment for cosine equalizer without using a network analyzer. If Section 9-9-3. “Cosine Equalizer Adjustment” is completed, this adjustment is not required.
- Perform this provisional adjustment only when the network analyzer is not available for an urgent maintenance. At a later date, be sure to readjust using the network analyzer referring to Section 9-9-3.

1. Confirm that each item of the following maitenance menus has been set to its default referring to Section 9-9-1 Step 3 “Default Setting.”
   If not, presetting and saving each are required. (Refer to Section 3-2-9.)
   All items of A33 : DM VR2
   All items of A34 : DM VR3
   Items of A35 : DM VR4 : OMC DC METAL-Y/C and A35 : DM VR4 : OMC DC OXIDE-Y/C
   Note
   If each data settig has been established in Section 9-9-1 “Preparation,” check is not required.

2. Set RVs on the DM-114/114P board to each specified position as shown in the figure.



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9-9-5. DM RF Output Level Pre-adjustment

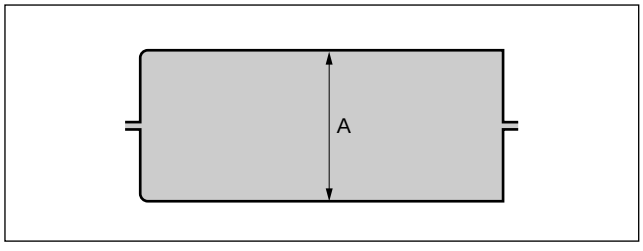
Measuring equipment : Oscilloscope
(20 MHz LIMIT : ON)

Preparation/Setting

1. Connect and set the oscilloscope as follows :
   CH-1 : TP112/DM-114 (⁎N-4), DC 1 V/DIV
   GND : E103/DM-114 (⁎N-4)
   CH-2 : TP107/DM-114 (⁎N-3), AC 100 mV/DIV, 2 ms/DIV
   GND : E103/DM-114 (⁎N-4)
   Trigger : CH-1, negative (−) slope

1. METAL Y adjustment

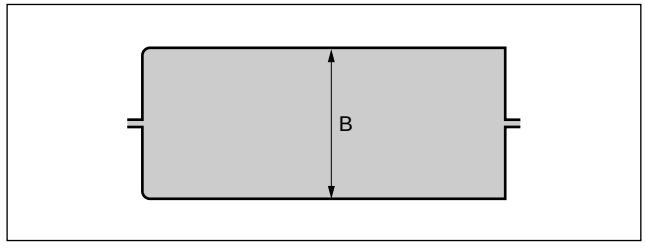
1. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV111/DM-114 (⁎N-4)
   Specification : A = 400 ±40 mV p-p



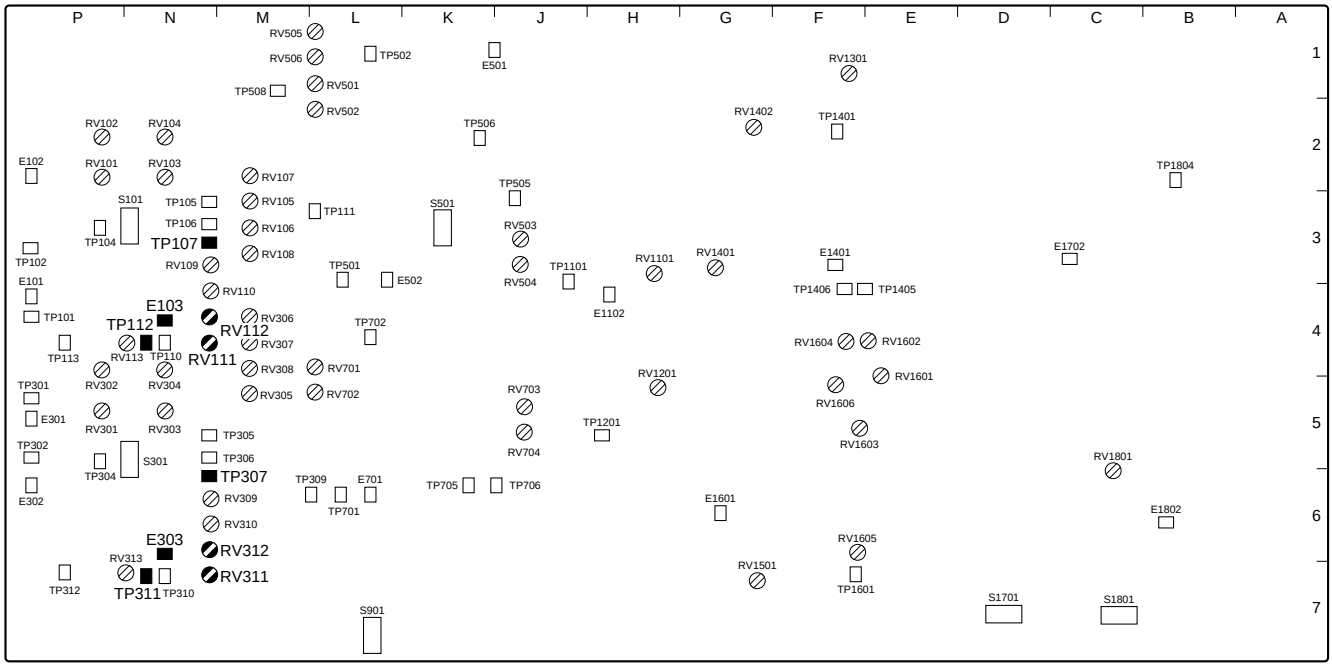
2. Stop the playback of the alignment tape.

2. METAL C adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP311/DM-114 (⁎N-7)
   GND : E303/DM-114 (⁎N-6)
   CH-2 : TP307/DM-114 (⁎N-6)
   GND : E303/DM-114 (⁎N-6)
2. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV311/DM-114 (⁎N-7)
   Specification : B = 400 ±40 mV p-p

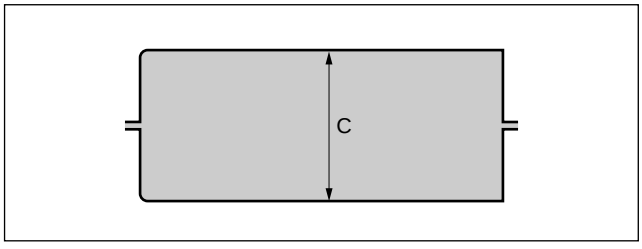


3. Eject the alignment tape.



3. OXIDE C adjustment

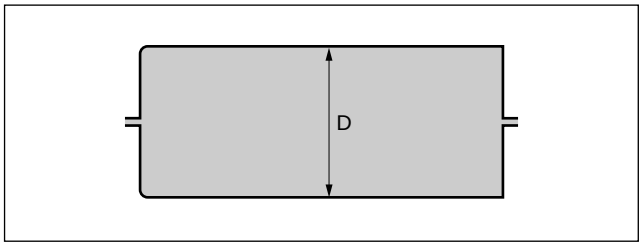
1. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment point : ⊘RV312/DM-114 (∗N-6)
   Specification : C = 400 ±40 mV p-p



2. Stop the playback of the alignment tape.

4. OXIDE Y adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP112/DM-114 (∗N-4)
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP107/DM-114 (∗N-3)
   GND : E103/DM-114 (∗N-4)
2. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment point : ⊘RV112/DM-114 (∗N-4)
   Specification : D = 400 ±40 mV p-p



3. Stop the playback of the alignment tape.

9-9-6. OMC Carrier Balance Adjustment

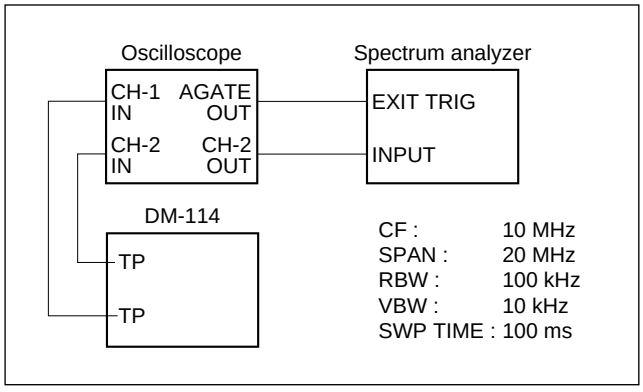
Note

If a spectrum analyzer is not available, perform Section 9-9-7 “OMC Carrier Balance Adjustment (Provisional).”

Measuring equipment :

Spectrum analyzer and Oscilloscope
(See the figure below for connection.)

Preparation/Setting

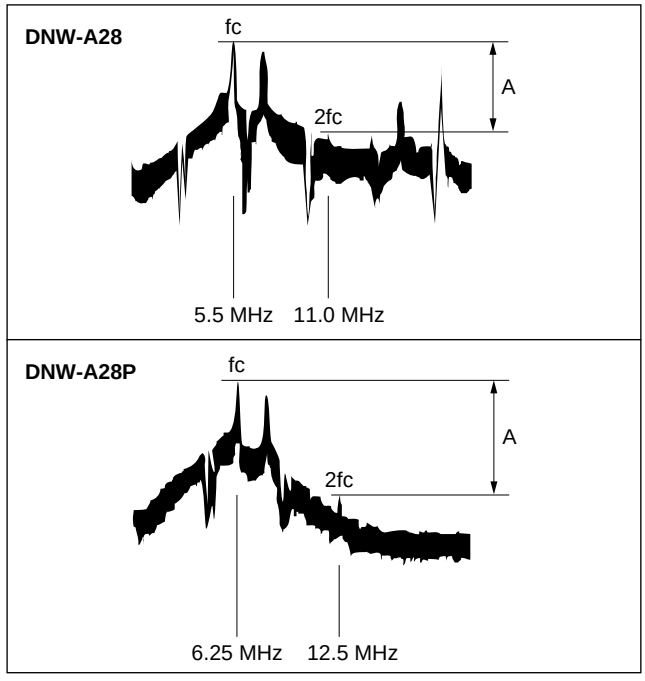


Connection and Setting of Spectrum Analyzer

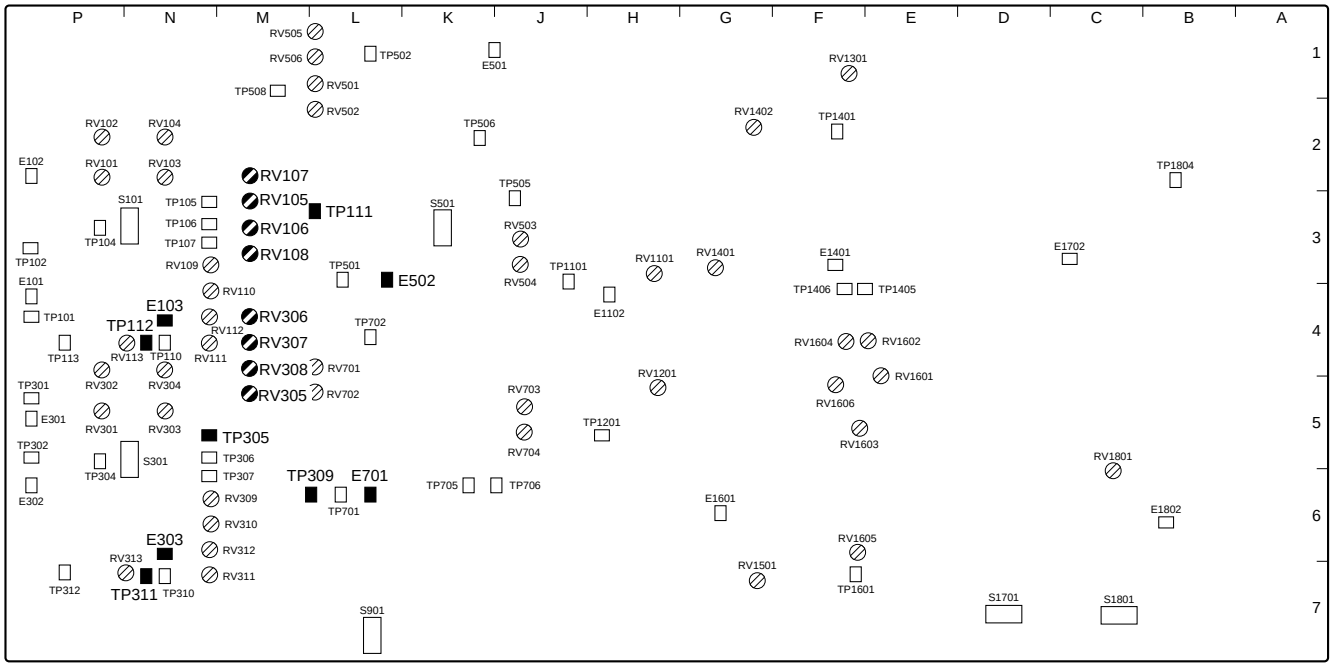
1. Connect and set the oscilloscope as follows :
   CH-1 : TP112/DM-114 (∗N-4), DC 1 V/DIV
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP111/DM-114 (∗L-3), AC 1 V/DIV
   GND : E502/DM-114 (∗L-3)
   TIME : 5 ms/DIV
   Trigger : CH-1, negative (−) slope

1. OXIDE Y adjustment

1. Play back the pulse & bar signal portion (9 : 00 to 11 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment points : ⊘RV107/DM-114 (∗M-2) and ⊘RV108/DM-114 (∗M-3)
   Specification : A ≧ 35 dB

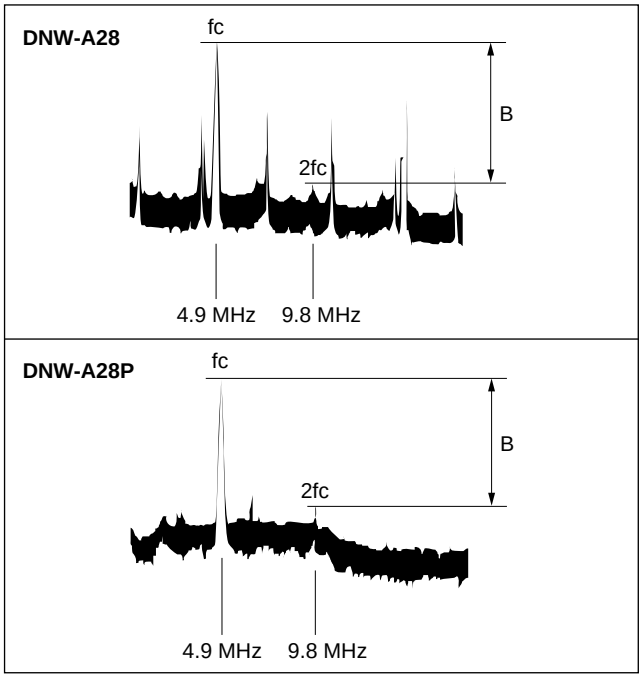


2. Stop the playback of the alignment tape.



2. OXIDE C adjustment

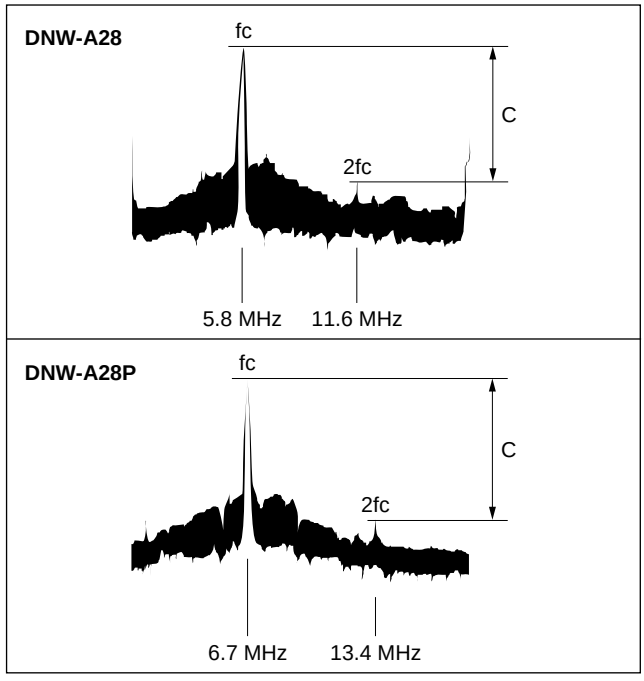
1. Change the connection of the oscilloscope as follows :
   CH-1 : TP311/DM-114 (⁎N-7)
   GND : E303/DM-114 (⁎N-6)
   CH-2 : TP309/DM-114 (C-4)
   GND : E701/DM-114 (⁎L-6)
2. Play back the pulse & bar signal portion (9 : 00 to 11 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment points : ⊘RV307/DM-114 (⁎M-4) and ⊘RV308/DM-114 (⁎M-4)
   Specification : B ≧ 35 dB



3. Eject the alignment tape.

3. METAL C adjustment

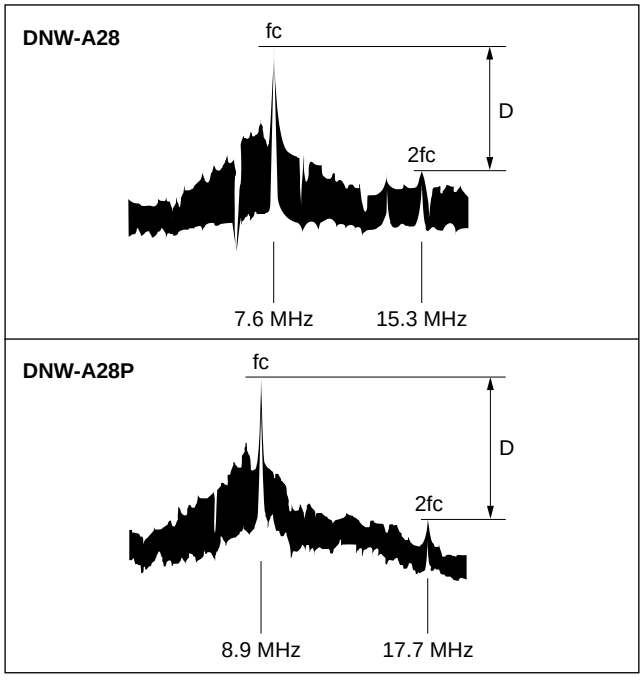
1. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment points : ⊘RV305/DM-114 (⁎M-5) and ⊘RV306/DM-114 (⁎M-4)
   Specification : C ≧ 40 dB



2. Stop the playback of the alignment tape.

4. METAL Y adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP112/DM-114 (∗N-4)
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP111/DM-114 (∗L-3)
   GND : E502/DM-114 (∗L-3)
2. Play back the flat filed signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment points : ⊘RV105/DM-114 (∗M-3) and ⊘RV106/DM-114 (∗M-3)
   Specification : D ≧ 40 dB



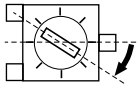
3. Stop the playback of the alignment tape.

9-9-7. OMC Carrier Balance Adjustment (Provisional)

Notes

- This section explains a provisional adjustment for OMC carrier balance without using a spectrum analyzer. If Section 9-9-6 “OMC Carrier Balance Adjustment” is completed, this adjustment is not required.
- Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. At a later date, be sure to readjust using the spectrum analyzer referring to Section 9-9-6.

Set the following RVs on the DM-114/114P board to the specified position respectively.



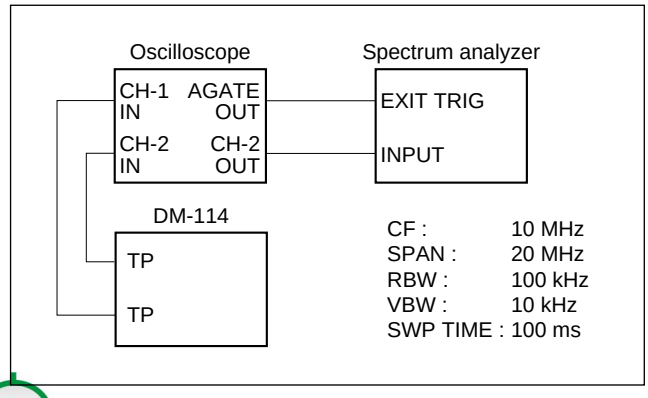
RV105 (⁎M-3)
RV106 (⁎M-3)
RV107 (⁎M-2)
RV108 (⁎M-3)
RV305 (⁎M-5)
RV306 (⁎M-4)
RV307 (⁎M-4)
RV308 (⁎M-4)

9-9-8. Demodulator Limiter Balance Adjustment

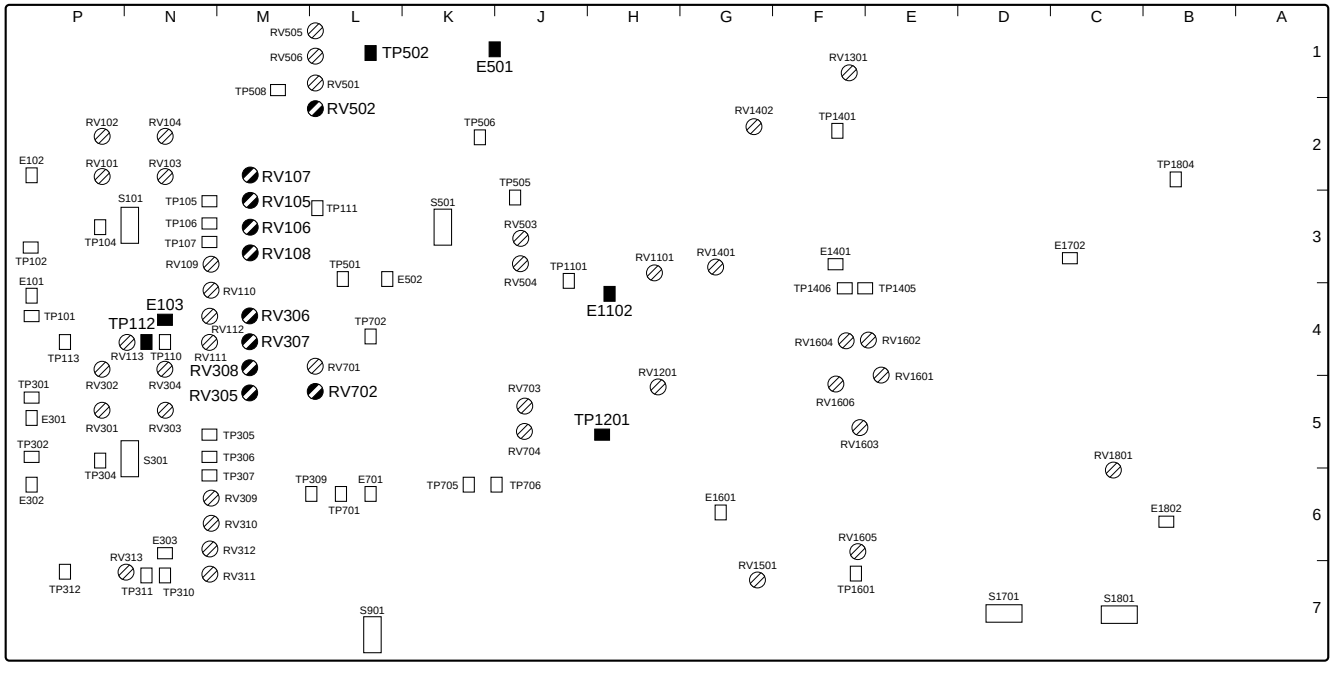
Measuring equipment : Spectrum analyzer and Oscilloscope (See the figure below for connection.)

Note

As for the Y adjustment, the provisional adjustment described below is allowed only when the spectrum analyzer is not available for an urgent maintenance. If the provisional adjustment is performed, be sure to readjust the Y signal using the spectrum analyzer at a later date.



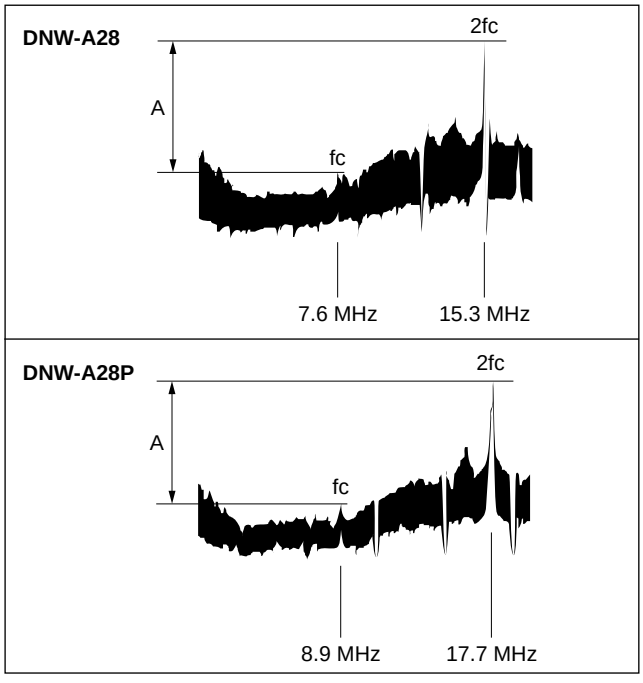
Connection and Setting of Spectrum Analyzer (during Y adjustment)



DM-114 Board (B Side)

1. Y adjustment (using the spectrum analyzer)

1. Connect and set the oscilloscope as follows :
   CH-1 : TP112/DM-114 (∗N-4), DC 1 V/DIV
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP502/DM-114 (∗L-1), AC 1 V/DIV, 5 ms/DIV
   GND : E501/DM-114 (∗J-1)
   Trigger : CH-1, negative (−) slope
2. Play back the flat filed signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ⊘RV502/DM-114 (∗L-2)
   Specification : Maximize the level difference A. (Minimize the fc.)



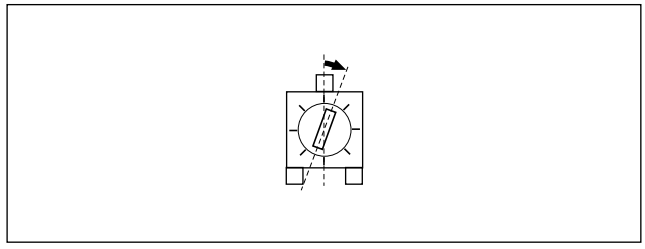
3. Stop the playback of the alignment tape.

2. Provisional Y adjustment (without using the spectrum analyzer)

Note

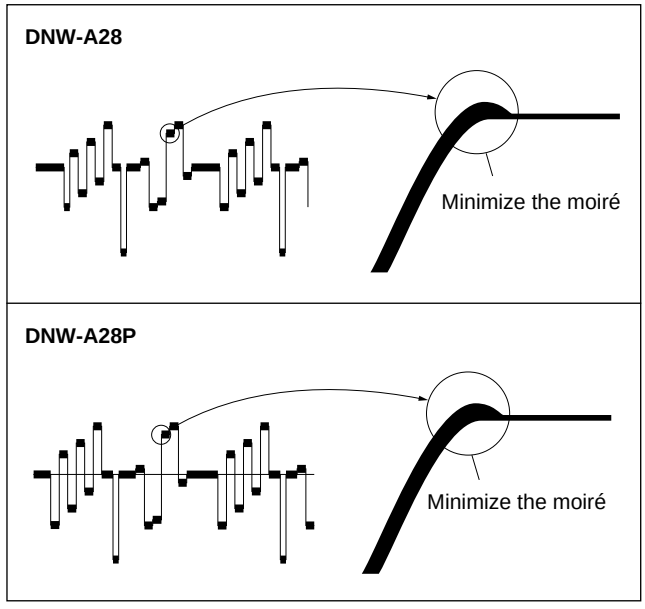
This section explains the provisional adjustment for Y signal without using a spectrum analyzer. If the above-mentioned Y adjustment is completed, this adjustment is not required.

Set RV502/DM-114 (∗L-2) as shown below.



3. C adjustment

1. Connect and set the oscilloscope as follows :
   CH-2 : TP1201/DM-114 (∗H-5), AC 200 mV/DIV
   GND : E1102/DM-114 (∗H-4)
   TIME : 10 µs/DIV
   Trigger : CH-2
2. Play back the color-bar signal portion (14 : 00 to 17 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ⊘RV702/DM-114 (∗L-5)
   Specification : Minimize the moiré at specified part.



3. Stop the playback of the alignment tape.

9-9-9. Non-liner Output Level Adjustment

Measuring equipment : Oscilloscope

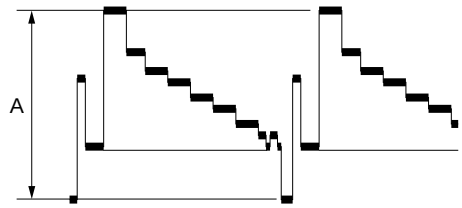
Preparation/Setting

1. Connect and set the oscilloscope as follows :
   CH-2 : TP506/DM-114 (∗K-2), AC 200 mV/DIV
   GND : E501/DM-114 (∗J-1)
   TIME : 10 µs/DIV
   Trigger : CH-2

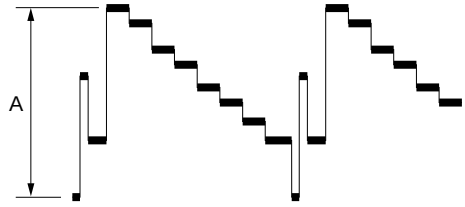
1. METAL Y adjustment

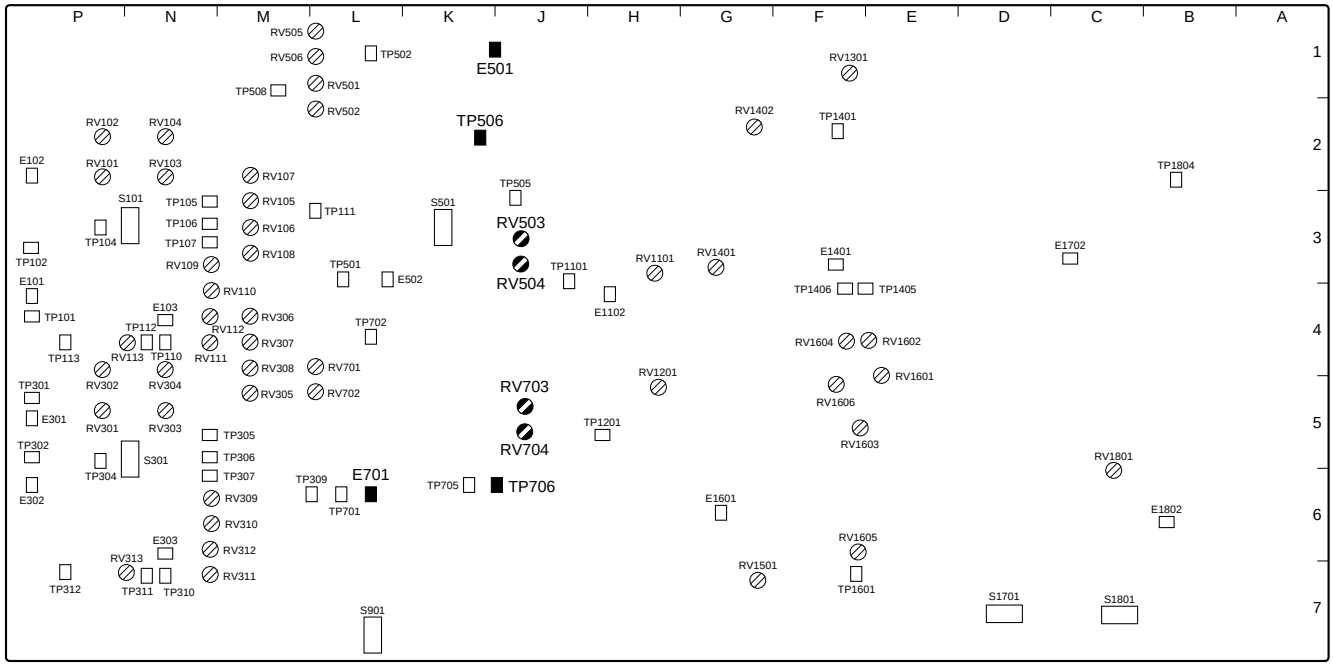
1. Play back the color-bar signal portion (14 : 00 to 17 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV503/DM-114 (∗J-3)
   Specification : A = 1.00 $^{+0.01}_{-0.05}$ Vp-p
2. Stop the playback of the alignment tape.

DNW-A28



DNW-A28P

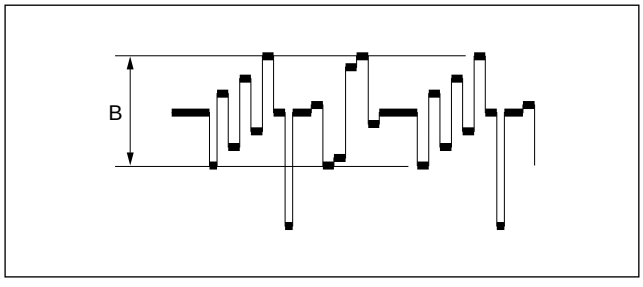




DM-114 Board (B Side)

2. C adjustment

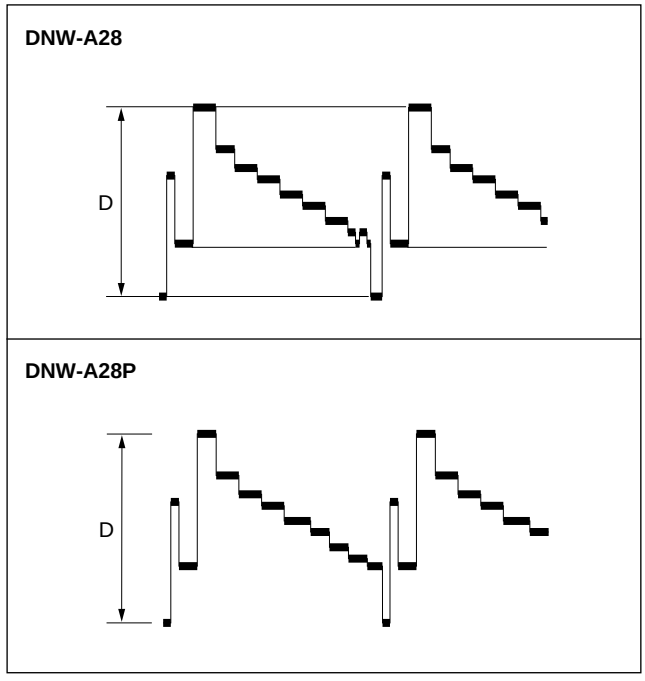
1. Change the connection of the oscilloscope as follows :
   CH-2 : TP706/DM-114 (∗J-6)
   GND : E701/DM-114 (∗L-6)
2. • For DNW-A28
   Play back the 75 % color-bar signal portion of the alignment tape CR5-1B (14 : 00 to 17 : 00), and perform the adjustment.
   Adjustment point : ⊘RV704/DM-114 (∗J-5)
   Specification : C = 700 ±10 mV
   • For DNW-A28P
   (1) METAL C adjustment
   Play back the 100 % color-bar signal portion (14 : 00 to 17 : 00) of the alignment tape CR5-1B PS, and perform the adjustment.
   Adjustment point : ⊘RV703/DM-114 (∗J-5)
   Specification : B = 933 ±10 mV
   (2) Eject the alignment tape CR5-1B PS.
   (3) OXIDE C adjustment
   Play back the 75 % color-bar signal portion of the alignment tape CR5-2A PS (0 : 00 to 3 : 00), and perform the adjustment.
   Adjustment point : ⊘RV704/DM-114 (∗J-5)
   Specification : C = 700 ±10 mV



3. For DNW-A28, eject the alignment tape CR5-1B.
   For DNW-A28P, stop the playback of the alignment tape CR5-2A PS.

3. OXIDE Y adjustment

1. Change the connection of the oscilloscope as follows :
   CH-2 : TP506/DM-114 (∗K-2)
   GND : E501/DM-114 (∗J-1)
2. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment point : ⊘RV504/DM-114 (∗J-3)
   Specification : D = 1.00 ±0.01 Vp-p



3. Eject the alignment tape.

9-9-10. PB Frequency Response Adjustment

Measuring equipment : Digital component waveform monitor

Preparation/Setting

1. Connect the digital component waveform monitor to the SDI OUT connector.
2. Startup the maintenance mode. (Refer to Section 9-1-1.)
3. Select A32 : DM VR 1 of the maintenance mode.

1. METAL Y adjustment

1. Observe the Y output signal on the component waveform monitor.
2. Play back the multiburst signal portion (8 : 00 to 11 : 00) of the alignment tape CR5-1B or CR5-1B PS, and adjust so that the level at 4.1 MHz (or 5 MHz for PAL) portion is within specification. And confirm that levels at other frequencies are within specifications. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

   Note

   The overlapping waveform of A channel and B channel signals is monitored on the component waveform monitor. So adjust/confirm the signal level at each channel.

   Adjustment points :

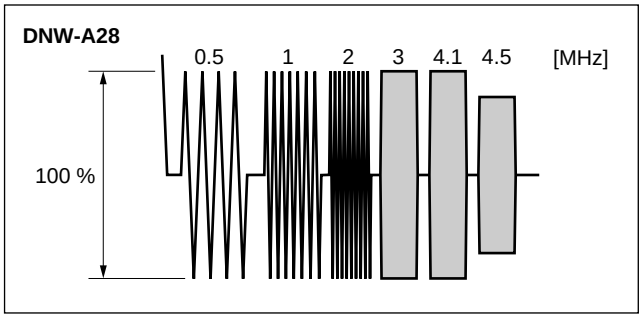
   A channel : A32 : DM VR 1 : EQ1 METAL-Y-A

   B channel : A32 : DM VR 1 : EQ1 METAL-Y-B

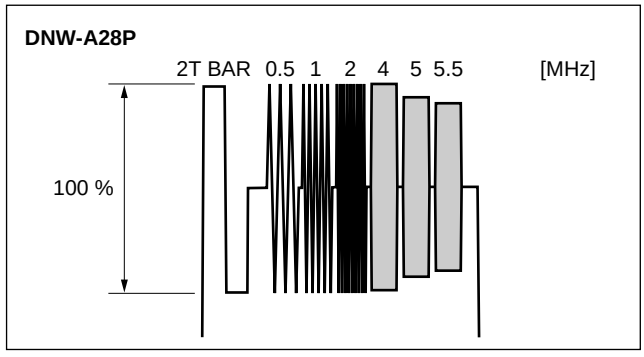
   Specifications (A and B channels) :

   See the table below.

Frequency	Specifications for DNW-A28
0.5 MHz	Reference : 100 % {0 dB}
4.1 MHz	Adjust : 94 (100 to 90) % {−0.5 $^{+0.5}_{-0.4}$ dB}
1 MHz	Check : 100 (106 to 63) % {0 $^{+0.5}_{-4.0}$ dB}
2 MHz	Check : 100 (106 to 63) % {0 $^{+0.5}_{-4.0}$ dB}
3 MHz	Check : 100 (106 to 63) % {0 $^{+0.5}_{-4.0}$ dB}
4.5 MHz	Check : 80 (106 to 63) % {−2.0 $^{+2.5}_{-2.0}$ dB}



Frequency	Specifications for DNW-A28P
2T BAR	Reference : 100 % {0 dB}
5 MHz	Adjust : 91 (96 to 87) % {−0.8 ±0.4 dB}
0.5 MHz	Check : 100 (106 to 63) % {0 $^{+0.5}_{-4.0}$ dB}
1 MHz	Check : 100 (106 to 63) % {0 $^{+0.5}_{-4.0}$ dB}
2 MHz	Check : 100 (106 to 63) % {0 $^{+0.5}_{-4.0}$ dB}
4 MHz	Check : 100 (106 to 63) % {0 $^{+0.5}_{-4.0}$ dB}
5.5 MHz	Check : 84 (106 to 63) % {−1.5 $^{+2.0}_{-2.5}$ dB}



3. Connect the video monitor to VIDEO OUTPUT 1 connector.
4. Play back the multiburst signal portion (8 : 00 to 11 : 00) of the alignment tape CR5-1B or CR5-1B PS, and check that the playback picture on the video monitor has no flicker. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
5. Reconnect the video monitor to VIDEO OUTPUT 2 (SUPER) connector.

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2. METAL C adjustment

1. Observe the R-Y output signal on the component waveform monitor.
2. Play back the multiburst signal portion (8 : 00 to 11 : 00) of the alignment tape CR5-1B or CR5-1B PS, and adjust so that the level at 1 MHz (or 1.5 MHz for PAL) portion is within specification. And confirm that levels at other frequencies are within specifications. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

Note

The overlapping waveform of A channel and B channel signals is monitored on the component waveform monitor. So adjust/confirm the signal level at each channel.

Adjustment points :

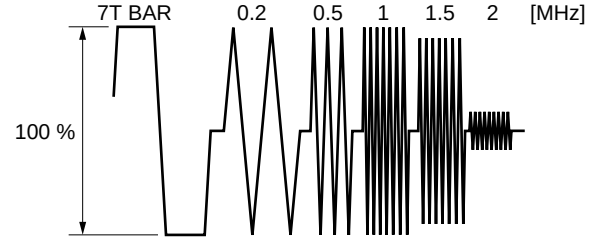
A channel : A32 : DM VR 1 : EQ1 METAL-C-A
B channel : A32 : DM VR 1 : EQ1 METAL-C-B

Specifications (A and B channels) :

See the table below.

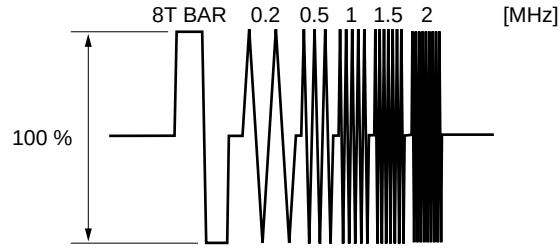
Frequency	Specifications for DNW-A28	
7T BAR	Reference : 100 % {0 dB}	
1 MHz	Adjust : 94 (100 to 89) %	{−0.5 ± 0.5 dB}
0.2 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check : 80 (106 to 71) %	{−2.0 $^{+2.5}_{-1.0}$ dB}

DNW-A28



Frequency	Specifications for DNW-A28P	
8T BAR	Reference : 100 % {0 dB}	
1.5 MHz	Adjust : 93 (102 to 85) %	{−0.6 ± 0.8 dB}
0.2 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
1 MHz	Check : 100 (106 to 71 %	{0 $^{+0.5}_{-3.0}$ dB}
2 MHz	Check : 80 (106 to 71) %	{−2.0 $^{+2.5}_{-1.0}$ dB}

DNW-A28P



3. Observe the B-Y output signal on the component waveform monitor. Confirm that the B-Y signal levels at every frequencies are within specifications shown above. If the B-Y signal is out of specifications, perform fine adjustment for R-Y until the specifications for both B-Y and R-Y signals are satisfied.
4. Eject the alignment tape.

3. OXIDE Y adjustment

1. Observe the Y output signal on the component waveform monitor.
2. Play back the multiburst signal portion (3 : 00 to 6 : 00) of the alignment tape CR5-2A or CR5-2A PS, and adjust so that the level at 2 MHz (or 3 MHz for PAL) portion is within specification. And confirm that levels at other frequencies are within specifications. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)

Note

The overlapping waveform of A channel and B channel signals is monitored on the component waveform monitor. Therefore, adjust and check the signal level at each channel.

Adjustment points :

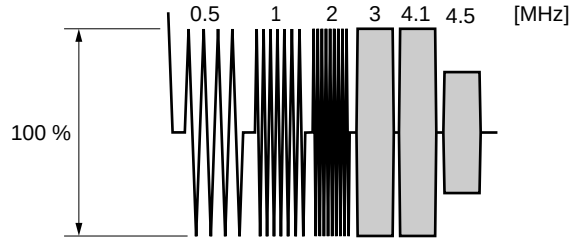
A channel : A32 : DM VR 1 : EQ1 OXIDE-Y-A
B channel : A32 : DM VR 1 : EQ1 OXIDE-Y-B

Specifications (A and B channels) :

See the table below.

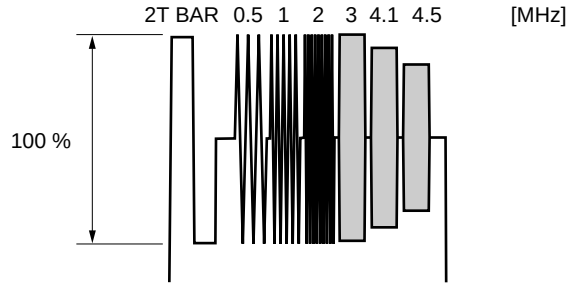
Frequency	Specifications for DNW-A28
0.5 MHz	Reference : 100 % {0 dB}
2 MHz	Adjust : 100 (104 to 95) % {0 $^{+0.3}_{-0.4}$ dB}
1 MHz	Check : 100 (106 to 50) % {0 $^{+0.5}_{-6.0}$ dB}
3 MHz	Check : 89 (106 to 50) % {−1.0 $^{+1.5}_{-5.0}$ dB}
4.1 MHz	Check : 71 (106 to 50) % {−3.0 $^{+3.5}_{-3.0}$ dB}

DNW-A28



Frequency	Specifications for DNW-A28P
2T BAR	Reference : 100 % {0 dB}
3 MHz	Adjust : 89 (100 to 79) % {−1.0 ±1.0 dB}
0.5 MHz	Check : 100 (106 to 50) % {0 $^{+0.5}_{-6.0}$ dB}
1 MHz	Check : 100 (106 to 50) % {0 $^{+0.5}_{-6.0}$ dB}
2 MHz	Check : 100 (106 to 50) % {0 $^{+0.5}_{-6.0}$ dB}
4.1 MHz	Check : 71 (106 to 50) % {−3.0 $^{+3.5}_{-3.0}$ dB}

DNW-A28P



3. Play back the multiburst signal portion (3 : 00 to 6 : 00) of the alignment tape CR5-2A or CR5-2A PS, and confirm that the level difference between the A and B channel signals is hardly noticeable at high frequency portion (4.5 MHz).

Note

If the level difference is noticeable at 4.5 MHz, adjustment using menu A34 : DM VR3 : SUB OXIDE-A or -B is required. Following steps ① to ⑦, adjust the channel with the lower level while playing back the multiburst signal portion (3 : 00 to 6 : 00) of the alignment tape.

① To exit from A32 : DM VR 1, press the MENU button once.
② Select A34 : DM VR 3 of the maintenance mode.
③ Change the data value of SUB OXIDE-Y-A (A channel side), and judge which signal is lower in level.
④ If the B channel signal is lower, return the data value of SUB OXIDE-Y-A to the former data, then adjust the SUB OXIDE-Y-B so as to increase the value until the level of B channel signal is almost equal to the level of A channel signal.
If the A channel signal is lower, adjust the SUB OXIDE-Y-A so as to increase the value until the level of A channel signal is almost equal to level of B channel signal.
⑤ To exit from A34 : DM VR 3, press the MENU button once.
⑥ Select A32 : DM VR 1.
⑦ To enable the tape operation, press the SET button once.

4. OXIDE C adjustment

1. Observe the R-Y output signal on the component waveform monitor.
2. Play back the multiburst signal portion (3 : 00 to 6 : 00) of the alignment tape CR5-2A or CR5-2A PS, and adjust so that the level at 1 MHz portion is within specification. Make sure that levels at other frequencies are within specifications. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)

Note

The overlapping waveform of A channel and B channel signals is monitored on the component waveform monitor. Therefore, adjust and check the signal level at each channel.

Adjustment points :

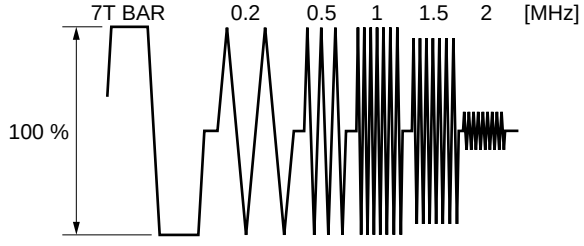
A channel : A32 : DM VR 1 : EQ1 OXIDE-C-A
B channel : A32 : DM VR 1 : EQ1 OXIDE-C-B

Specifications (A and B channels) :

See the table below.

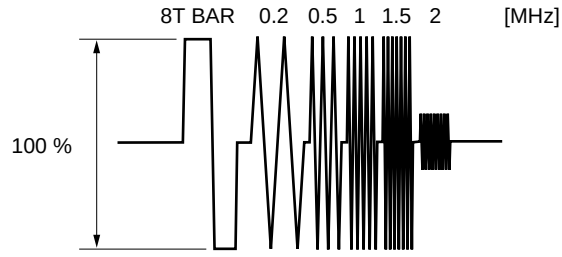
Frequency	Specifications for DNW-A28	
7T BAR	Reference : 100 % {0 dB}	
1 MHz	Adjust : 94 (100 to 89) %	{−0.5 ±0.5 dB}
0.2 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check : 95 (106 to 71) %	{−0.4 $^{+0.9}_{-2.6}$ dB}
1.5 MHz	Check : 80 (106 to 71) %	{−2.0 $^{+2.5}_{-1.0}$ dB}

DNW-A28



Frequency	Specifications for DNW-A28P	
8T BAR	Reference : 100 % {0 dB}	
1 MHz	Adjust : 94 (102 to 86) %	{−0.5 ±0.8 dB}
0.2 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check : 100 (106 to 71) %	{0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check : 84 (106 to 71) %	{−1.5 $^{+2.0}_{-1.5}$ dB}

DNW-A28P



3. Observe the B-Y output signal on the component waveform monitor. Confirm the B-Y signal levels at every frequencies are within specifications shown above. If the B-Y signal is out of specifications, perform fine adjustment for R-Y until the specifications for both B-Y and R-Y signals are satisfied.
4. Eject the alignment tape.
5. To exit from A32 : DM VR 1, press the MENU button once.

5. Saving data

1. Select A3F : NV-RAM CONTROL of the maintenance mode, and execute “SAVE ALL ADJUST DATA.”
2. Check that the message “Save Complete” is displayed on the monitor.
3. To exit from A3F : NV-RAM CONTROL, press the MENU button once.
4. To exit the maintenance mode, press the MENU button three times.

9-9-11. Dropout Compensation Equalizer Adjustment

Measuring equipment : Oscilloscope

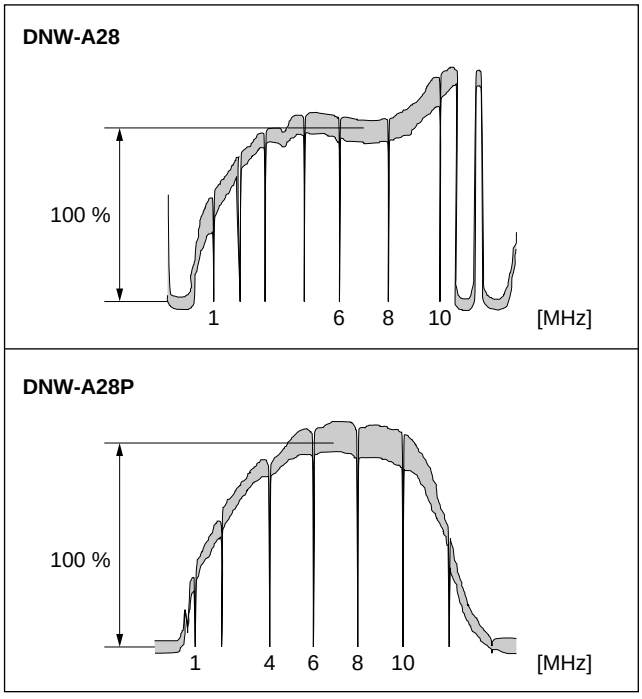
Preparation/Setting

1. Connect and set the oscilloscope as follows :
   CH-1 : TP112/DM-114 (∗N-4), DC 1 V/DIV
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP113/DM-114 (∗P-4), DC >200 mV/DIV, 2 ms/DIV
   GND : E101/DM-114 (∗P-4)
   Trigger : CH-1, − slope

1. METAL Y adjustment

1. Play back the RF sweep signal portion (0 : 00 to 2 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ⊘RV109/DM-114 (∗N-3)
   Specifications : Refer to table below.

Frequency	Specifications for DNW-A28	Specifications for DNW-A28P
6 MHz	Reference :100 % {0 dB}	Reference : 100 % {0 dB}
8 MHz	100 ±20 % {0 ±2.0 dB}	100 ±20 % {0 ±2.0 dB}
10 MHz	120 $^{+50}_{-20}$ % {2.0 $^{+5.0}_{-2.0}$ dB}	110 $^{+40}_{-20}$ % {1.0 $^{+4.0}_{-2.0}$ dB}



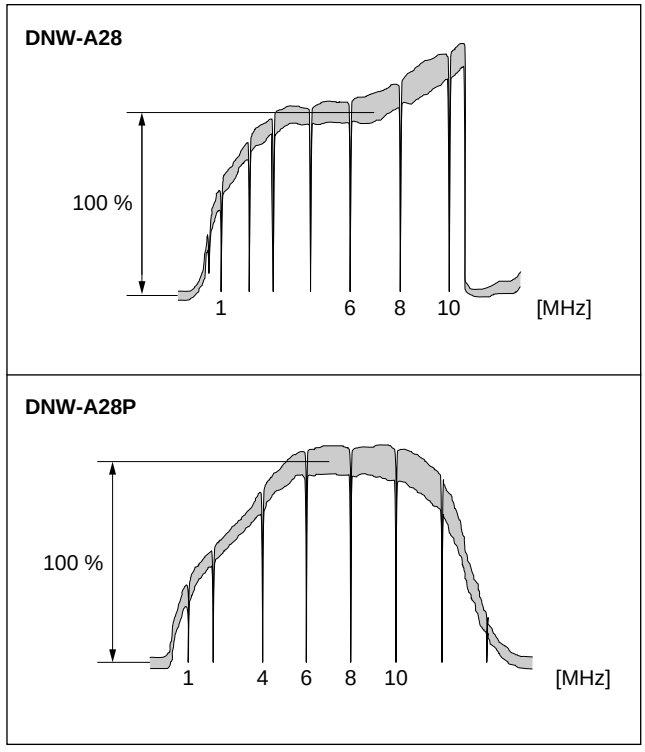
2. Stop the playback of the alignment tape.

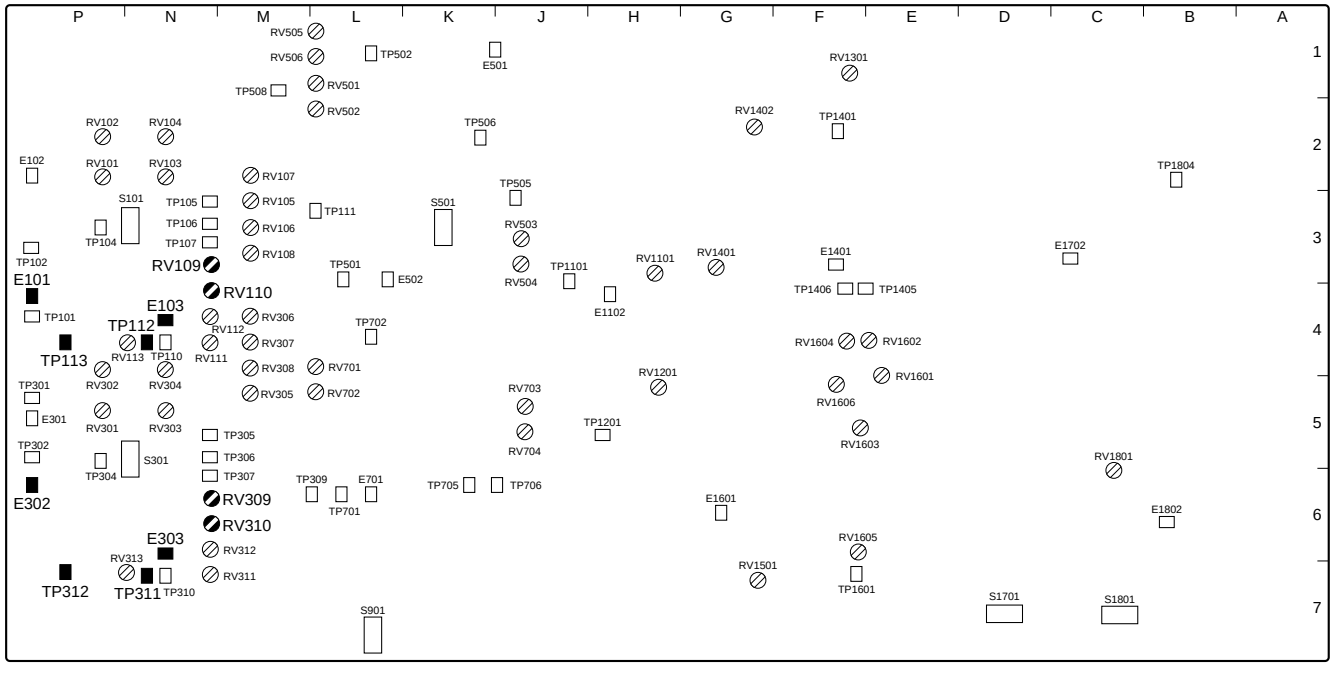
2. METAL C adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP311/DM-114 (∗N-7)
   GND : E303/DM-114 (∗N-6)
   CH-2 : TP312/DM-114 (∗P-7)
   GND : E302/DM-114 (∗P-6)
2. Play back the RF sweep signal portion (0 : 00 to 2 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment.
   (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV309/DM-114 (∗N-6)
   Specifications : See the table below.

Frequency	Specifications
6 MHz	Reference : 100 % {0 dB}
8 MHz	100 ±20 % {0 ±2.0 dB}
10 MHz	110 $^{+40}_{-20}$ % {1.0 $^{+4.0}_{-2.0}$ dB}

3. Stop the playback of the alignment tape.

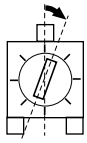




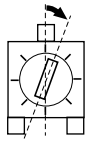
DM-114 Board (B Side)

3. OXIDE Y/C adjustment

1. Set RVs on the DM-114/114P board to each specified position as shown below.



RV110 (∗N-4)



RV310 (∗N-6)

9-9-12. DM RF Output Level adjustment

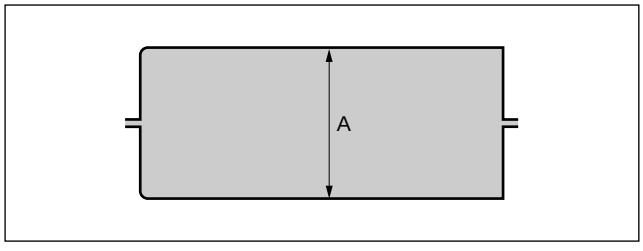
Measuring equipment : Oscilloscope
(20 MHz BW LIMIT : ON)

Preparation/Setting

1. Connect and set the oscilloscope as follows :
   CH-1 : TP112/DM-114 (⁎N-4), DC 1 V/DIV
   GND : E103/DM-114 (⁎N-4)
   CH-2 : TP107/DM-114 (⁎N-3), AC 100 mV/DIV
   GND : E103/DM-114 (⁎N-4)
   TIME : 2 ms/DIV
   Trigger : CH-1, negative (−) slope

1. METAL Y adjustment

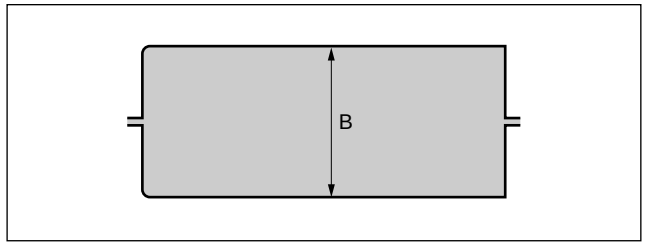
1. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV111/DM-114 (⁎N-4)
   Specification : A = 400 ±40 mV p-p



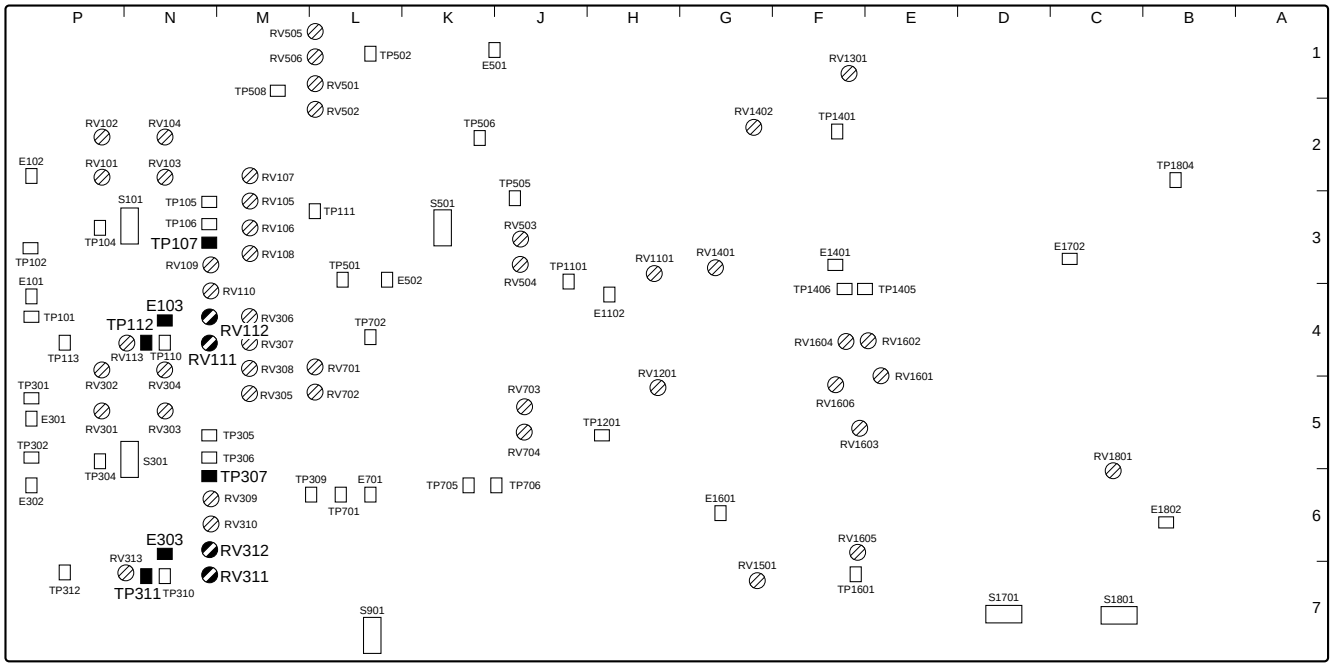
2. Stop the playback of the alignment tape.

2. METAL C adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP311/DM-114 (⁎N-7)
   GND : E303/DM-114 (⁎N-6)
   CH-2 : TP307/DM-114 (⁎N-6)
   GND : E303/DM-114 (⁎N-6)
2. Play back the flat field signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV311/DM-114 (⁎N-7)
   Specification : B = 400 ±40 mV p-p

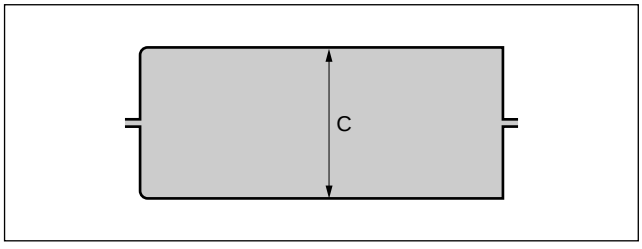


3. Eject the alignment tape.



3. OXIDE C adjustment

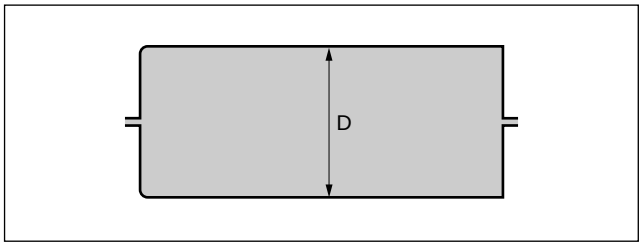
1. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment point : ⊘RV312/DM-114 (⁎N-6)
   Specification : C = 400 ±40 mV p-p



2. Stop the playback of the alignment tape.

4. OXIDE Y adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP112/DM-114 (⁎N-4)
   GND : E103/DM-114 (⁎N-4)
   CH-2 : TP107/DM-114 (⁎N-3)
   GND : E103/DM-114 (⁎N-4)
2. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
   Adjustment point : ⊘RV112/DM-114 (⁎N-4)
   Specification : D = 400 ±40 mV p-p



3. Eject the alignment tape.

9-9-13. RF Envelope Adjustment

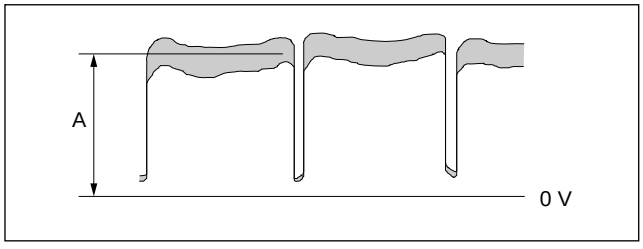
Measuring equipment : Oscilloscope

Preparation/Setting

1. Connect and set the oscilloscope as follows :
   CH-1 : TP112/DM-114 (∗N-4), DC 1 V/DIV
   GND : E103/DM-114 (∗N-4)
   CH-2 : TP113/DM-114 (∗P-4), DC 500 mV/DIV
   GND : E103/DM-114 (∗N-4)
   TIME : 5 ms/DIV
   Trigger : CH-1, negative (−) slope

1. Y adjustment

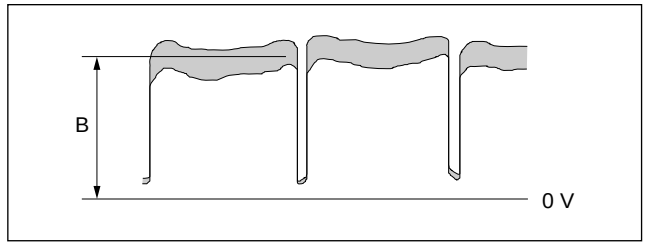
1. Play back the flat filed signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV113/DM-114 (∗N-4)
   Specification : A = 2.0 ±0.2 V dc



3. Stop the playback of the alignment tape.

2. C adjustment

1. Change the connection of the oscilloscope as follows :
   CH-1 : TP311/DM-114 (∗N-7)
   GND : E303/DM-114 (∗N-6)
   CH-2 : TP312/DM-114 (∗P-7)
   GND : E303/DM-114 (∗N-6)
2. Play back the flat filed signal portion (24 : 00 to 26 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment point : ◓RV313/DM-114 (∗N-7)
   Specification : B = 2.0 ±0.2 V dc



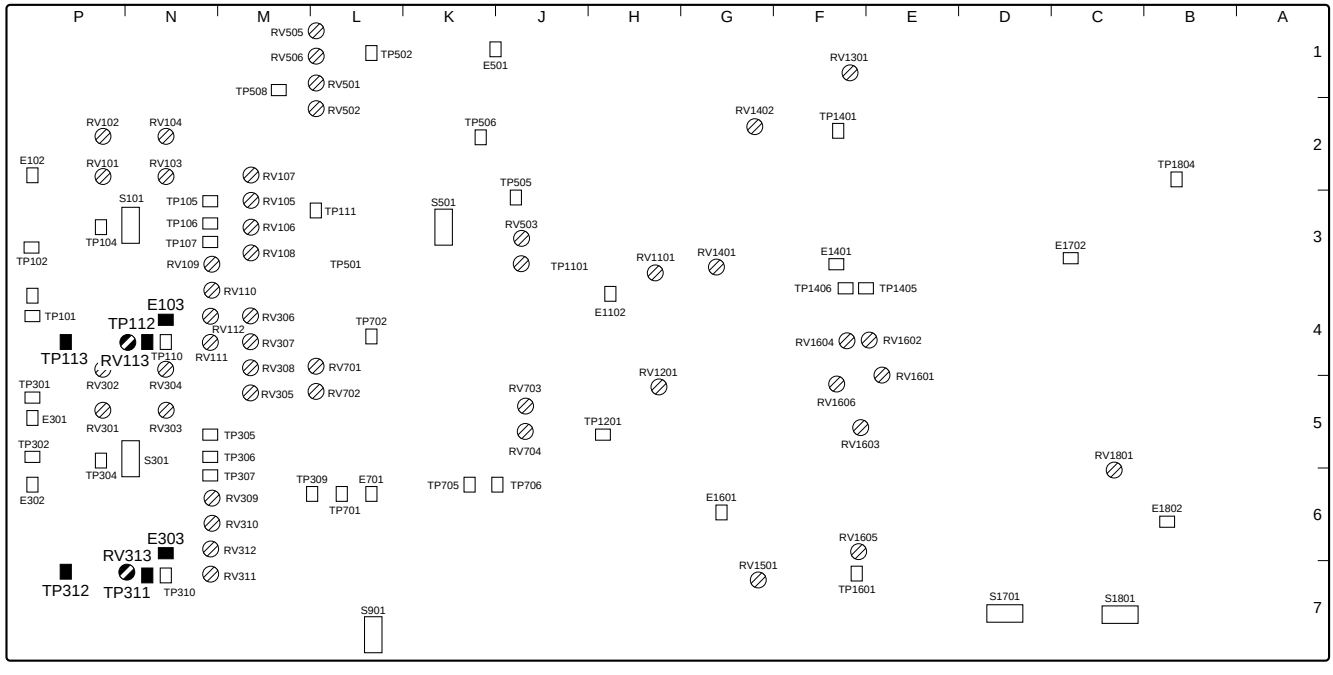
3. Stop the playback of the alignment tape.

3. Threshold Level Check

1. Preset and save data of the maintenance menu A36 : DM VR 5 : ENV-TH-H/L referring to Section 9-9-1 Step 3 “Default Setting.”

Note

If data setting has been established in Section 9-9-1 “Preparation,” presetting is not required.



DM-114 Board (B Side)

9-9-14. Search Picture Adjustment

It is not necessary to perform this adjustment when the board is replaced.

Measuring equipment : Digital voltmeter and Oscilloscope

Preparation/Setting

1. Extend the DM-114/114P board. (Refer to Section 1-7.)

1. Voltage measurement

1. Play back the color-bar signal portion (14 : 00 to 17 : 00) of the alignment tape CR5-1B or CR5-1B PS, and measure the DC voltage level at the following test points using the digital voltmeter. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

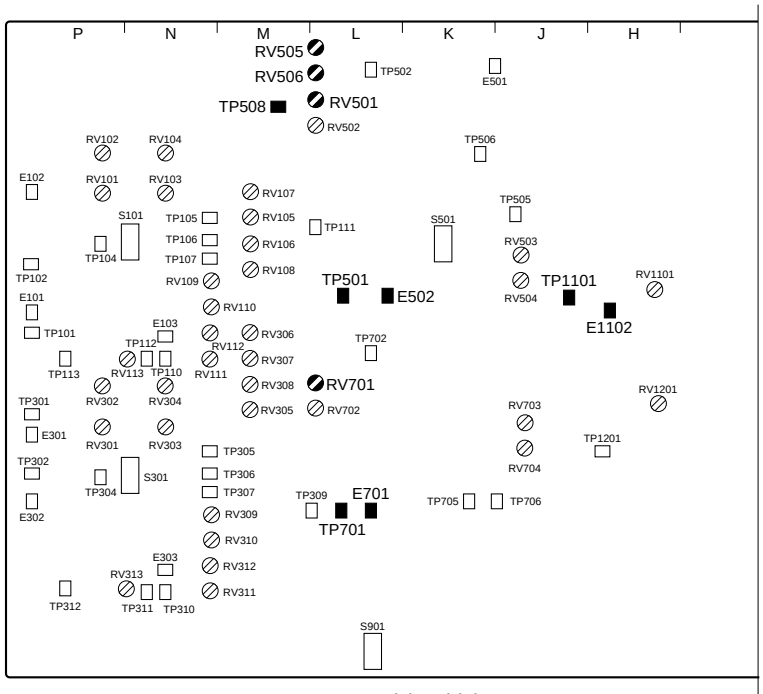
Test point	Measurement value (fill in)
TP508/DM-114 (⁎M-1)	
TP503/DM-114 (K-2)	
TP703/DM-114 (L-6)	

2. Voltage adjustment

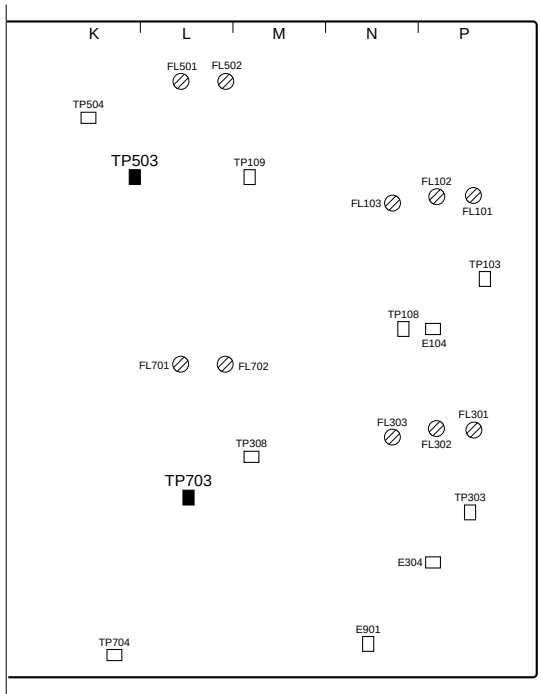
1. Turn RV506/DM-114 (⁎L-1) fully clockwise (↻).
2. Short-circuit between TP501/DM-114 (⁎L-3) and E502/DM-114 (⁎L-3) with a shorting clip.
3. Short-circuit between TP701/DM-114 (⁎L-6) and E701/DM-114 (⁎L-6) with a shorting clip.
4. Play back the color-bar signal portion (14 : 00 to 17 : 00) of the alignment tape CR5-1B or CR5-1B PS, and adjust the DC voltage level at the following test points so as to be equal to the voltage measured in step 1. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

Test point	Adjustment point	Remarks
TP508/DM-114 (⁎M-1)	◓RV505/DM-114 (⁎L-1)	SPD OFFSET
TP503/DM-114 (K-2)	◓RV501/DM-114 (⁎L-1)	Y DEEM
TP703/DM-114 (L-6)	◓RV701/DM-114 (⁎L-4)	C DEEM

5. Disconnect the shorting clip from TP501/DM-114 (⁎L-3) and E502/DM-114 (⁎L-3).
6. Disconnect the shorting clip from TP701/DM-114 (⁎L-6) and E701/DM-114 (⁎L-6).
7. Connect and set the oscilloscope as follows :
   CH-2 : TP1101/DM-114 (⁎J-3), DC 1 V/DIV
   GND : E1102/DM-114 (⁎H-4)
   Time : 10 μs/DIV



DM-114 Board (B Side)



DM-114 Board (A Side)

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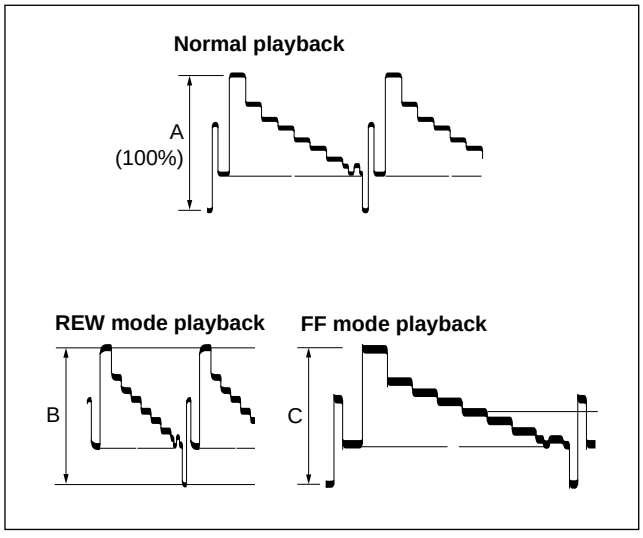
3. Gain adjustment

1. Play back the color-bar signal portion (14 : 00 to 17 : 00) of the alignment tape CR5-1B or CR5-1B PS in the following modes, and perform the adjustment and check.
   (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

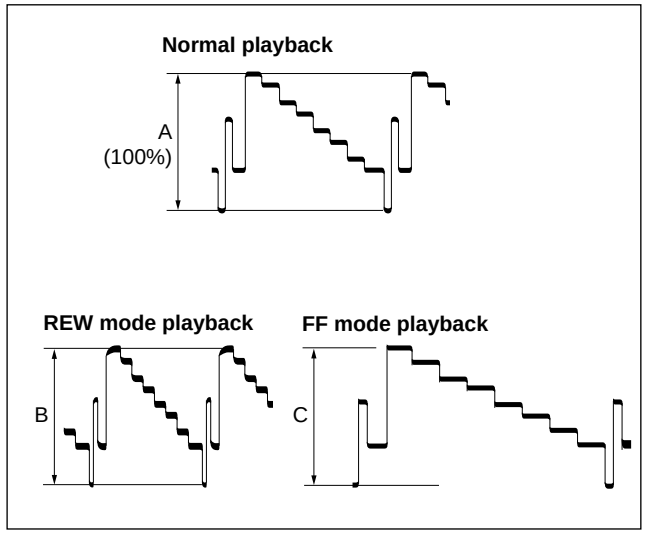
For DNW-A28

Playback mode	Specification	Adjustment point
Normal	Reference A : 100 % (0 dB)	–
REW	B = 105 ±5 % (0.4 ±0.4 dB)	⊘RV506/DM-114 (⁎L-1)
FF	C = 100 ±10 % (0 ±1.0 dB)	Check only



For DNW-A28P

Playback mode	Specification	Adjustment point
Normal	Reference A : 100 % (0 dB)	–
REW	B = 105 ±5 % (0.4 ±0.4 dB)	⊘RV506/DM-114 (⁎L-1)
FF	C = 100 ±10 % (0 ±1.0 dB)	Check only



2. Stop the playback of the alignment tape.
3. Return the DM-114/114P board to its normal position.

9-9-15. Guard Band Width Adjustment

Measuring equipment : Video monitor

Preparation/Setting

1. Preset and save data of A35 : DM VR 4;GUARD BAND referring to Section 9-9-1 Step 3 “Default Setting.”

   Note

   If data setting has been established in Section 9-9-1 “Preparation,” presetting is not required.
2. Play back the color-bar signal portion (14 : 00 to 17 : 00) of the alignment tape CR5-1B or CR5-1B PS in the JOG mode. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
3. Turn the JOG dial until guard band appears at the center of the monitor screen.
   (See Figure 1 on the next page.)

1. METAL guard band width adjustment

(1) Confirm that the guard band widths are met the following specifications. If both width are within the specifications, proceed to step 2 “Metal C confirmation.” If not, perform the following steps (2) and (3).
Specification 1 : Guard band width is below a third of monitor screen’s height.
Specification 2 : Guard band width for C is wider than for Y.

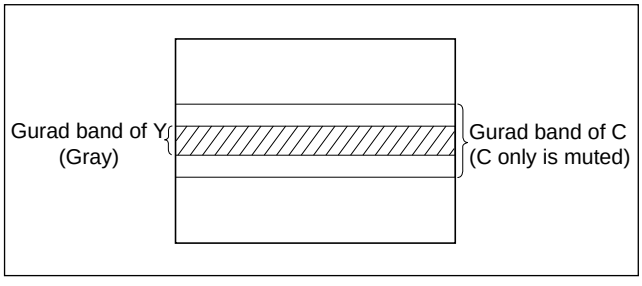


Figure 1. Guard Band

(2) If the specification 1 is not met:
Subtract 1 from each data value of GUARD BAND METAL-Y and GUARD BAND METAL-C, then confirm that the specifications of step (1) are met.
(3) If the specification 2 is not met:
Add 1 to the data value of GUARD BAND METAL-C, then confirm that the specifications of step (1) are met.

2. METAL C confirmation

(1) Play back the color-bar signal portion (14 : 00 to 17 : 00) of the alignment tape CR5-1B or CR5-1B PS in the VARIABLE +1 time speed mode (or the search +1 time speed), and confirm that the following specification is satisfied. If satisfied, go to step (3). If not, perform step (2).
(DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
Specification 3 : The picture (color-bar) on the video monitor is colored.
(The C signal is not fully muted.)
(2) If the specification 3 is not satisfied :
Subtract 1 from the data value of GUARD BAND METAL-C, confirm that the specifications in step (1) is satisfied again.
(3) Eject the alignment tape CR5-1B/CR5-1B PS.

3. OXIDE, Guard band width confirmation

(1) Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS in the JOG mode. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)

(2) Turn the JOG dial until guard band appears at the center of the video monitor screen.
(See to Figure 2.)

(3) Make sure that the guard band width satisfies the following specifications. If both are satisfied, go to step 4. OXIDE C comfirmation. If not, perform step (4) or (5).
Specification 1 : Guard band width is below a half of monitor screen's height.
Specification 2 : Guard band width for C is wider than for Y.

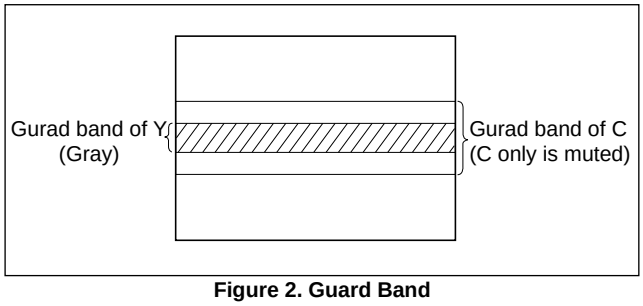


Figure 2. Guard Band

(4) If the specification 1 is not satisfied :
Subtract 1 from each data value of GUARD BAND OXIDE-Y and GUARD BAND OXIDE-C, then confirm that the specifications in step (3) are satisfied again.

(5) If the specification 2 is not satisfied :
Add 1 to the data value of GUARD BAND OXIDE-C, then confirm that the specifications in step (3) are satisfied again.

4. OXIDE C confirmation

(1) Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS in the VARIABLE +1 time speed mode (or the search +1 time speed), and confirm that the following specification is satisfied. If satisfied, go to step (3). If not, perform step (2).
(DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
Specification 3 : The picture (color-bar) on the video monitor is colored.
(The C signal is not fully muted.)

(2) If the specification 3 is not satisfied :
Subtract 1 from the data value of GUARD BAND OXIDE-C, then confirm that the specification in step (1) is satisfied.

(3) Eject the alignment tape CR5-2A/CR5-2A PS.

(4) To exit from A35 : DM VR 4, press the MENU button once.

5. Saving data

(1) Select A3F : NV-RAM CONTROL of the maintenance mode, then execute "SAVE ALL ADJUST DATA."

(2) Check that the message "Save Complete" is displayed on the video monitor.

(3) To exit from A3F : NV-RAM CONTROL, press the MENU button once.

(4) To exit from the maintenance mode, press the MENU button three times.

9-9-16. SDI Output Level Adjustment

Measuring equipment : Digital component waveform monitor

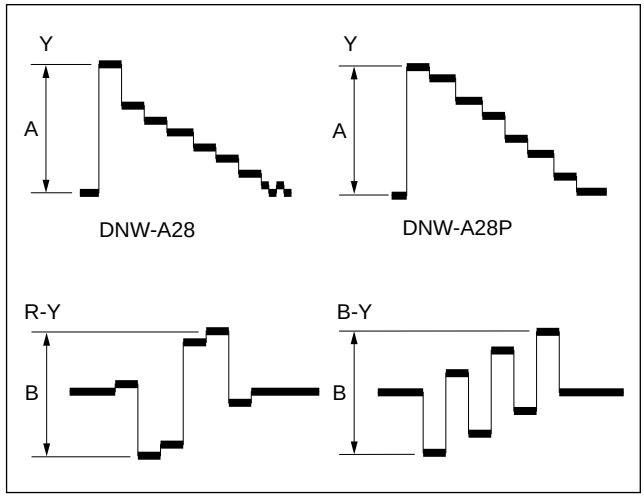
Preparation/Setting

1. Connect the digital component waveform monitor to SDI OUTPUT connector.

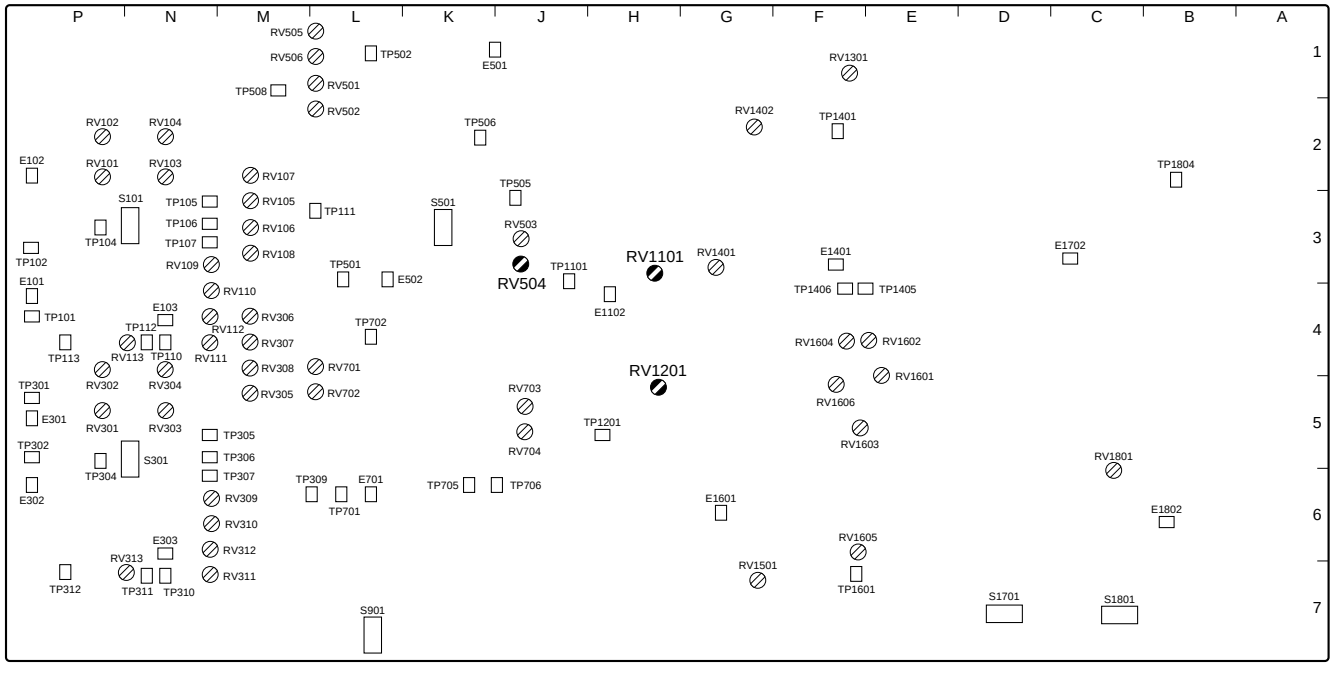
1. METAL Y/C adjustment

1. Play back the color-bar signal portion (14 : 00 to 17 : 00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment for each component signal level.
   (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

Observation component	Specifications	Adjustment point
Y	A = 700 ±7 mV	◓RV1101/DM-114 (⁎H-3)
R-Y/B-Y	B = 486 ±5 mV p-p (DNW-A28) B = 700 ±7 mV p-p (DNW-A28P)	◓RV1201/DM-114 (⁎H-5)



2. Eject the alignment tape.



DM-114 Board (B Side)

2. OXIDE Y/C confirmation

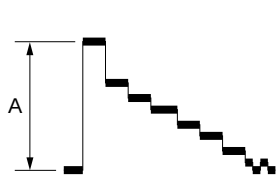
1. Play back the 75 % color-bar signal portion (0 : 00 to 3 : 00) of the alignment tape CR5-2A or CR5-2A PS, and then check that each component signal level is satisfied. Perform the adjustment only when the level is out of specification. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)

   Note

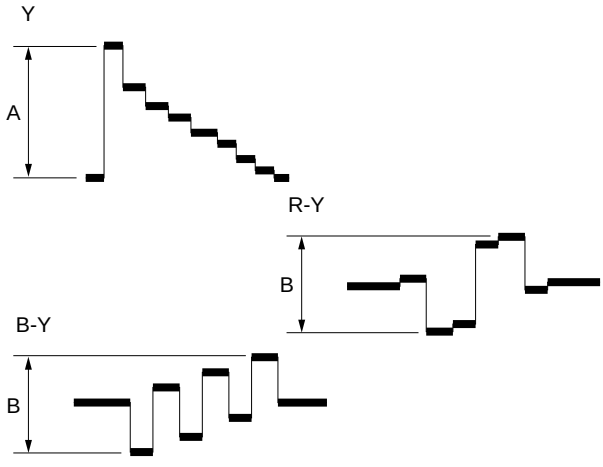
   For DNW-A28, observe Y signal only.

Observation component	Specifications	Adjustment point
Y	A = 700 ±7 mV	⊘RV504/DM-114 (⁎J-3)
R-Y/B-Y	– (DNW-A28) B = 525 ±5 mV p-p (DNW-A28P)	⊘RV704/DM-114 (⁎J-5) DNW-A28P only

DNW-A28



DNW-A28P



2. Eject the alignment tape.

9-9-17. VCO Lock-in Range Adjustment

It is not necessary to perform this adjustment when the board is replaced.

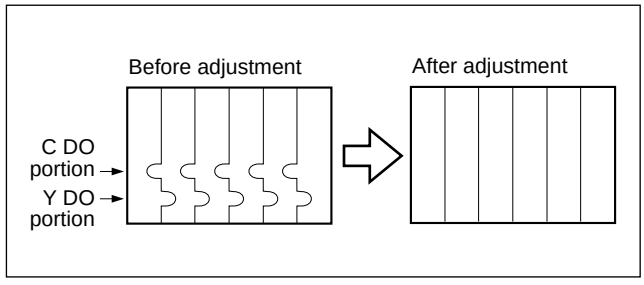
Measuring equipment : Oscilloscope

1. Extend the DM-114/114P board.
   (Refer to Section 1-7.)
2. Connect and set the oscilloscope as follows :
   CH-1 : TP1401/DM-114 (∗F-2), DC 1 V/DIV
   GND : E1401/DM-114 (∗F-3)
   CH-2 : TP1601/DM-114 (∗F-7), DC 1 V/DIV
   GND : E1601/DM-114 (∗G-6)
3. Play back the color-bar signal portion (14 : 00 to 17 : 00) of the alignment tape CR5-1B or CR5-1B PS, then adjust each DC level of Y side and C side.
   (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
   Adjustment points :
   Y (CH-1) side : ◓LV1401/DM-114 (F-1)
   C (CH-2) side : ◓LV1601/DM-114 (F-7)
   Specifications :
   Y : 2.2 ±0.2 V dc
   C : 2.0 ±0.2 V dc
4. Stop the playback of the alignment tape.
5. Return the DM-114/114P board to its normal position.

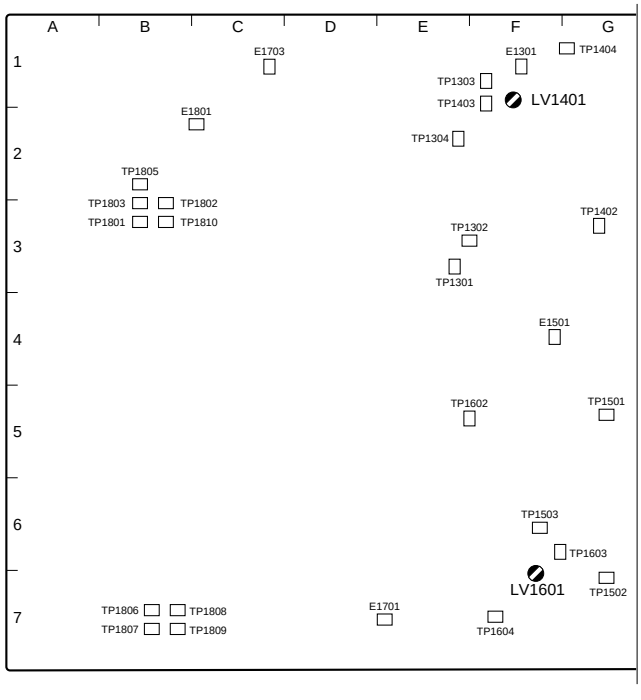
9-9-18. VCO Free-run Adjustment

Measuring equipment : Video monitor

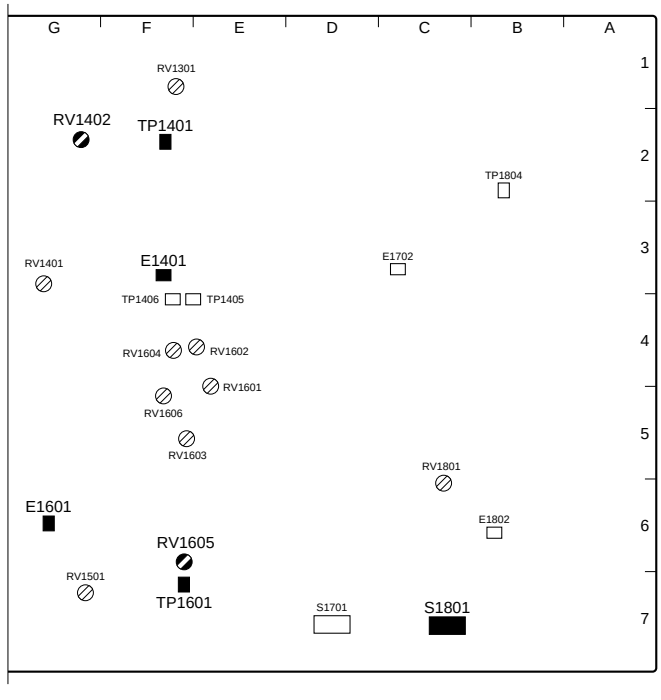
1. Set S1801-2/DM-114[IMP OFF] to ON.
2. Play back the color-bar signal portion (26 : 00 to 28 : 00) of the alignment tape CR5-1B or CR5-1B PS.
   (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
3. Adjust the following RVs until the drop-out portions (Y DO and C DO) of color-bar displayed on the video monitor disappear.
   Adjustment points : Y DO : ◓RV1402/DM-114 (∗G-2)
   C DO : ◓RV1605/DM-114 (∗F-6)
   Specifications : See the figure below



4. Stop the playback of the alignment tape.
5. Return S1801-2/DM-114 to OFF.



DM-114 Board (A Side)



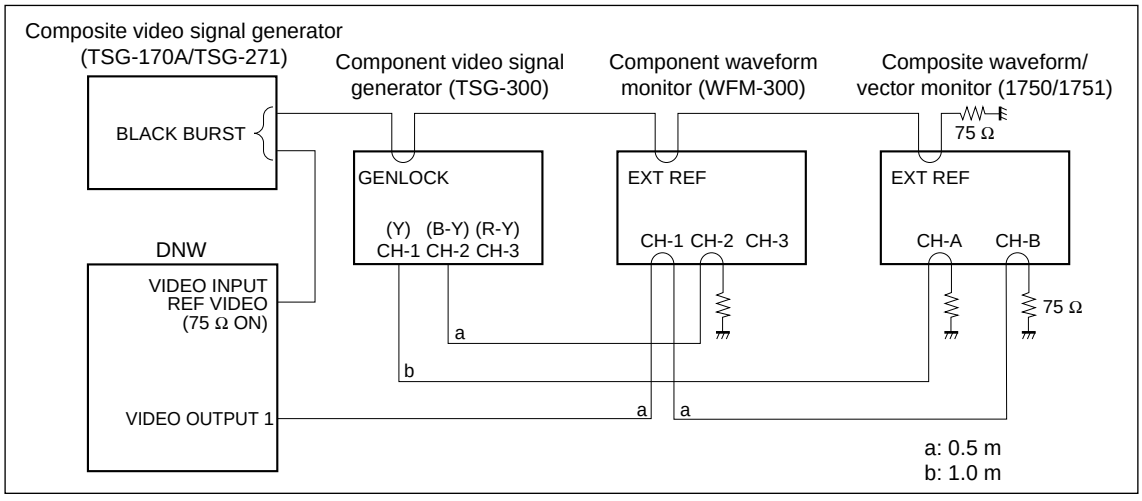
DM-114 Board (B Side)

9-9-19. PB Video Phase Adjustment

Measuring equipment : See the figure below.

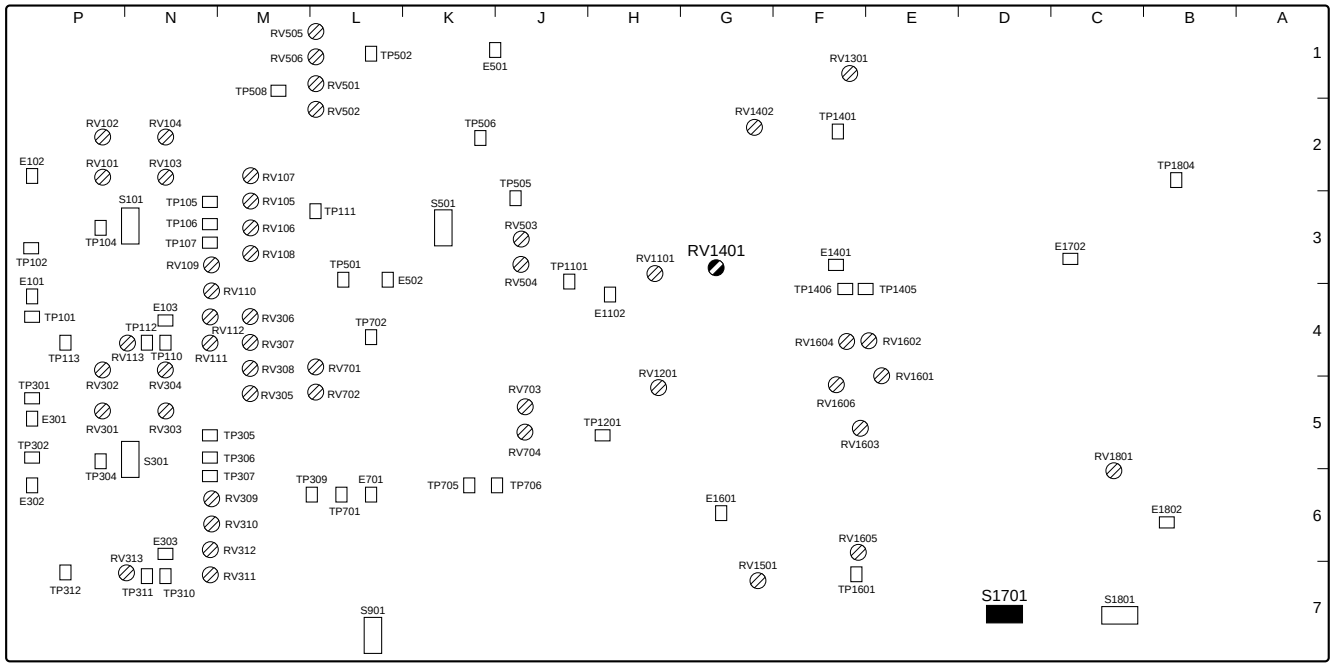
Preparation/Setting

1. Connect the video signal generators, measuring equipment, and video monitor as shown above. And set the output of the component video signal generator to 50 % bowtie signal.



2. Switch setting
   Set S1701-4/DM-114 (⁎D-7)[C MUTE] to ON.
3. Setting of Sub menu
   - Video setting page
     OUT REF → REF

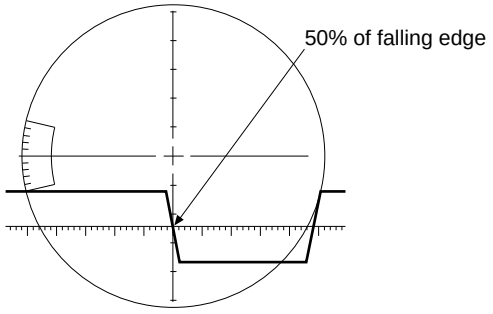
(Regarding the sub menu setting, refer to Section2 of operation manual.)



1. System SYNC position adjustment

1. Set the composite waveform/vector monitor as follows : WAVEFORM mode, SWEEP : 2H, MAG ON, INPUT : CH-A, EXT REF
2. Display the H SYNC signal portion of CH-A side on the composite waveform/vector monitor, and align 50 % position of falling edge for readability. (See the figure below.)
3. Play back the bowtie signal portion (17 : 00 to 19 : 00) of the alignment tape CR5-1B or CR5-1B PS. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
4. Change the observation signal (channel) of the composite waveform/vector monitor from CH-A to CH-B, then adjust “SYNC PH” item of the sub menu (Video setting page) so that the 50 % portion for CH-B corresponds to that for CH-A.

Composite waveform/vector monitor



5. Stop the playback of the alignment tape.

2. System SYNC phase adjustment

1. Set the composite waveform/vector monitor as follows : SCH mode, INPUT : CH-A, EXT REF
2. Adjust the SYNC phase of CH-A with 0 degree using PHASE knob of the composite waveform/vector monitor. (See the figure below.)

   Note

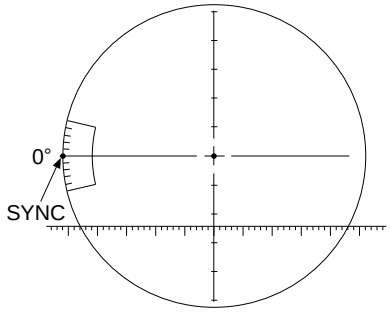
   Turn the PHASE knob so that the beam spot (SYNC) moves in the shortest route to 0 degree.
3. Play back the bowtie signal portion (17 : 00 to 19 : 00) of the alignment tape CR5-1B or CR5-1B PS. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
4. Change the observation signal (channel) of the composite waveform/vector monitor from CH-A to CH-B, then adjust “SC PH” item of the sub menu (Video setting page) so that the SYNC (beam spot) of CH-B is aligned with 0 degree.

   Note

   Adjust “SC PH” so that the beam spot (SYNC) moves in the shortest route to 0 degree.

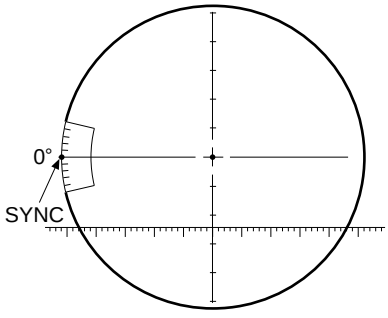
DNW-A28

Composite waveform/vector monitor



DNW-A28P

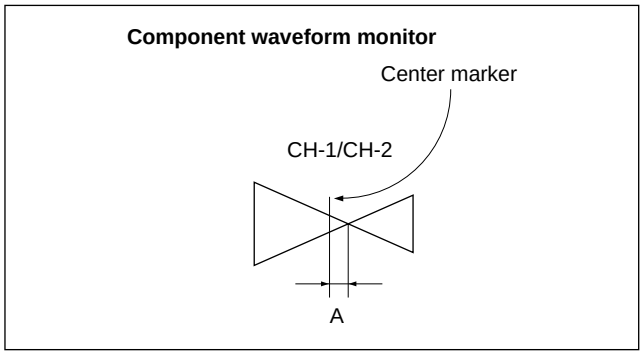
Composite waveform/vector monitor



5. Stop the playback of the alignment tape.

3. Y phase adjustment

1. Put the component waveform monitor into BOWTIE mode.
2. Play back the bowtie signal portion (17 : 00 to 19 : 00) of the alignment tape CR5-1B or CR5-1B PS.
   (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
3. Observe the bowtie dip point at CH-1 (Y) and CH-2 (B-Y) signals cross. Adjust so that the deviation between the center marker and bowtie dip point is within specification.
   Adjustment point : ⊘RV1401/DM-114 (⁎G-3)
   Specifications : A = 0 ± 10 ns



If the specification is not satisfied by adjustment, perform steps (1) through (4) after setting RV1401 to the mechanical center.

4. Additional adjustment if the PB video phase cannot be adjusted by step 3 (RV1401).

(1) Play back the bowtie signal portion (17 : 00 to 19 : 00) of the alignment tape CR5-1B or CR5-1B PS again.
(2) Active the maintenance mode, and select A37 : TBC VR.
(3) Change the data value of "SQ Y RZ" within ± 1 so that the bowtie dip point moves closer to the center marker.
(4) Perform step 3 of "3. Y phase adjustment" again.

5. Saving data

Note

Be sure to save data only when SQ Y RZ's data value of A37 : TBC VR is changed.

1. To exit from A37 : TBC VR, press the MENU button on the front panel.
2. Select A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA."
3. Check that the message "Save Complete" is displayed on the video monitor.
4. To exit from A3F : NV-RAM CONTROL, press the MENU button once.
5. To exit from the maintenance mode, press the MENU button three times.
6. Set S1701-4/DM-114 (⁎D-7) [C MUTE] to OFF.

9-9-20. TBC Y/C Delay Pre-adjustment

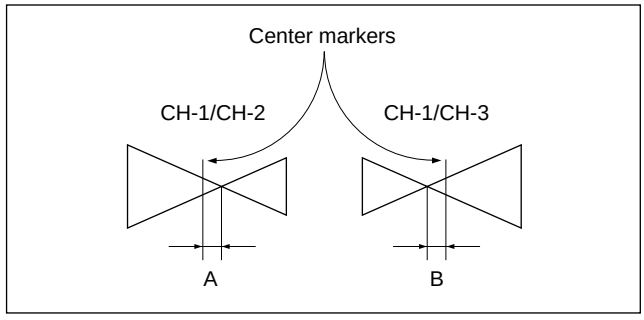
Measuring equipment : Digital component waveform monitor

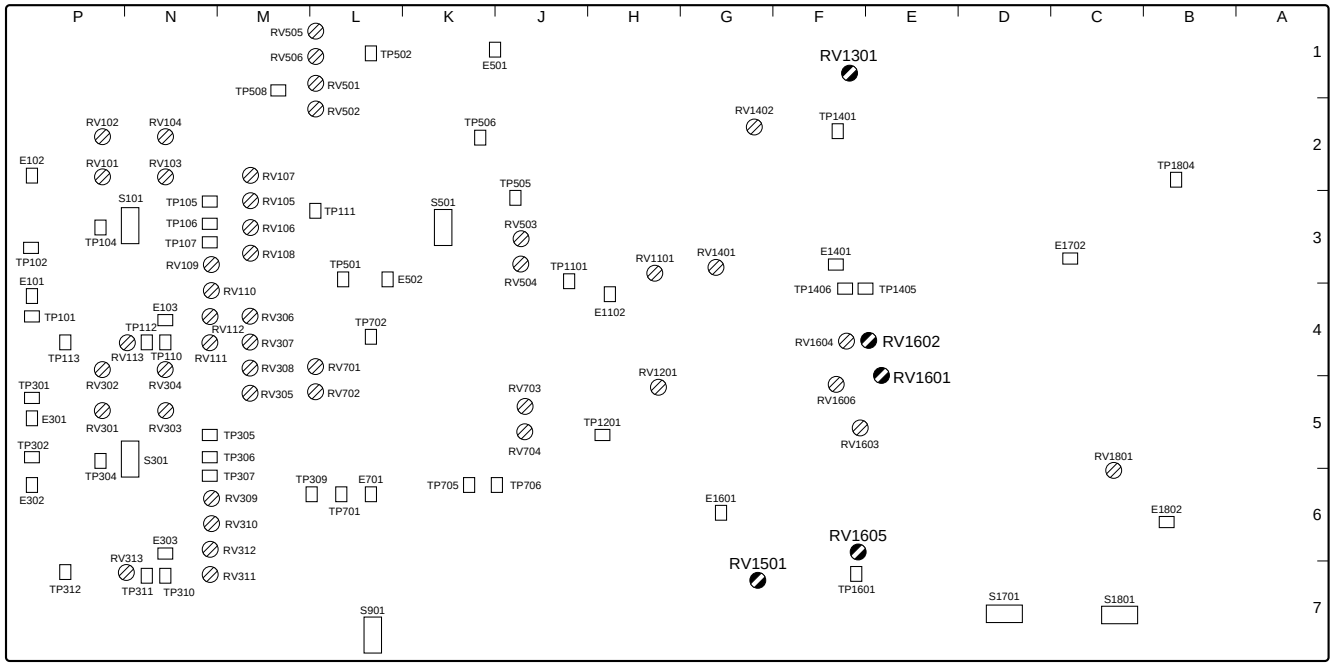
Preparation/Setting

1. Connect the digital component waveform monitor to SDI OUTPUT connector.
2. Turn RV1606/DM-114 (∗F-5) fully counterclockwise (↺).
3. Put the component waveform monitor into BOWTIE mode.

1. METAL adjustment

1. Play back the bowtie signal portion (17 : 00 to 19 : 00) of the alignment tape CR5-1B or CR5-1B PS. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
2. Observe the bowtie dip points at which the CH-1 (Y) and CH-2 (B-Y) signals cross, and CH-1 (Y) and CH-3 (R-Y) signals cross, adjust so that difference of deviations between each dip point and center marker is within specification.
   Adjustment point : ◓RV1605/DM-114 (∗F-6)
   Specification : A − B = 0 ±10 ns





DM-114 Board (B Side)

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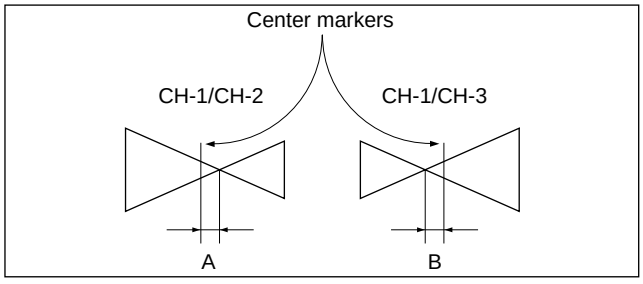
3. Observe the bowtie dip points at which the CH-1 (Y) and CH-2 (B-Y) signals cross, and CH-1 (Y) and CH-3 (R-Y) signals cross, adjust so that each deviation is within specification.
   Adjustment points :
   Field 1 : ⊘RV1601/DM-114 (∗E-4)
   Field 2 : ⊘RV1602/DM-114 (∗E-4)
   Specifications : A = 0 ±10 ns
   B = 0 ±10 ns



If the specification is not satisfied by adjusting RV1601, perform steps 7 through 10 after setting RV1601 to the mechanical center.

2. Additional adjustment if the Y/C delay cannot be adjusted by step 1 (RV1601)

(1) Play back the bowtie signal portion (17 : 00 to 19 : 00) of the alignment tape CR5-1B or CR5-1B PS again.
(2) Activate the maintenance mode, then select A37 : TBC VR.
(3) Change the data value of “SQ C RZ” within ±2 so that the bowtie dip points at which the CH-1 (Y) and CH-2 (B-Y) signals cross, and CH-1 (Y) and CH-3 (R-Y) signals cross, move closer to each center marker.
(4) Perform step 3 of “1. METAL adjustment” again.

3. Saving data

Note

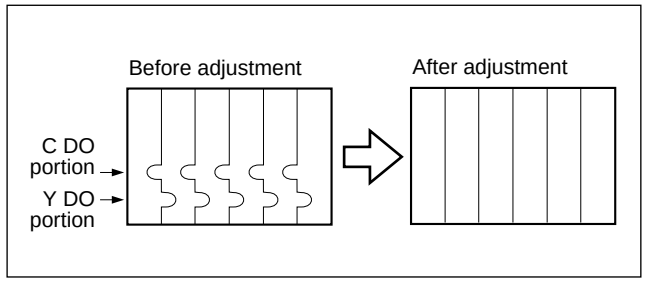
Be sure to save data only when SQ C RZ’s data value of A37 : TBC VR is changed.

1. To exit A37 : TBC VR, press the MENU button on the front panel.
2. Select A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA.”
3. Check that the message “Save Complete” is displayed on the video monitor.
4. To exit from A3F : NV-RAM CONTROL, press the MENU button once.
5. To exit from the maintenance mode, press the MENU button three times again.
6. Stop the playback of the alignment tape CR5-1B/CR5-1B PS.

9-9-21. Impact Error Offset Adjustment

Measuring equipment : Video monitor

1. Play back the color-bar signal portion (26 : 00 to 28 : 00) of the alignment tape CR5-1B or CR5-1B PS. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
2. Adjust the following RVs until the drop-out portions (Y DO and C DO) of color-bar displayed on the video monitor disappear.
   Adjustment points :Y DO : ⊘RV1301/DM-114 (∗F-1)
   C DO : ⊘RV1501/DM-114 (∗G-7)
   Specification : See the figure below.



3. Eject the alignment tape.

9-9-22. TBC Y/C Delay Adjustment

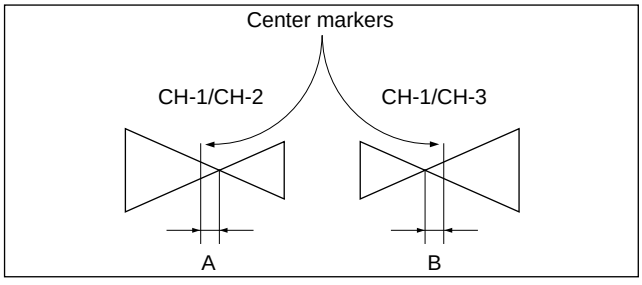
Measuring equipments : Digital Component waveform monitor

Preparation/Setting

1. Put the component waveform monitor into BOWTIE mode.

1. METAL adjustment

1. Play back the bowtie signal portion (17 : 00 to 19 : 00) of the alignment tape CR5-1B or CR5-1B PS. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)
2. Observe the bowtie dip point at which the CH-1 (Y) and CH-2 (B-Y) signals cross. Adjust so that the deviation between the center marker and bowtie dip point is within specification. Then observe the point at which the CH-1 (Y) and CH-3 (R-Y) signals cross and adjust in the same manner.
   Adjustment points :
   Field 1 : ⊘RV1601/DM-114 (∗E-4)
   Field 2 : ⊘RV1602/DM-114 (∗E-4)
   Specifications : A = 0 ± 10 ns
   B = 0 ± 10 ns



3. Eject the alignment tape.

2. OXIDE adjustment

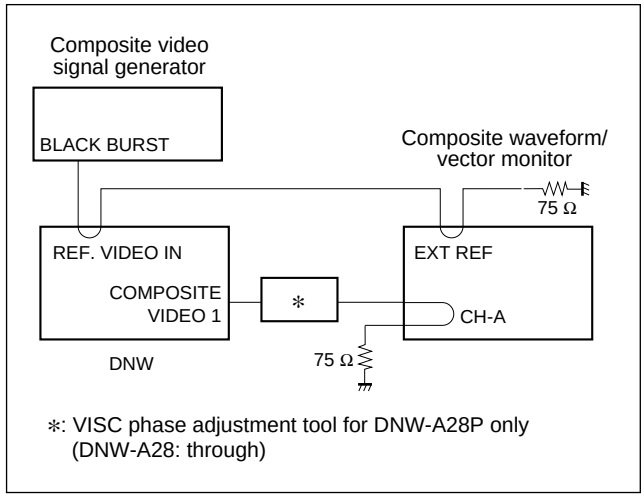
1. Play back the bowtie signal portion (6 : 00 to 9 : 00) of the alignment tape CR5-2A or CR5-2A PS. (DNW-A28 : CR5-2A, DNW-A28P : CR5-2A PS)
2. Observe the bowtie dip point at which the CH-1 (Y) and CH-2 (B-Y) signals cross. Adjust so that the deviation between the center marker and bowtie dip point is within specification. Then observe the point at which the CH-1 (Y) and CH-3 (R-Y) signals cross and adjust in the same manner.
   Adjustment point : ⊘RV1603/DM-114 (∗F-5)
   ⊘RV1604/DM-114 (∗F-4)
   Specifications : A = 0 ± 10 ns
   B = 0 ± 10 ns
3. Eject the alignment tape.

9-9-23. VISC Phase Adjustment

Measuring equipment : Composite waveform/vector monitor

Preparation/Setting

1. Connect the video signal generator, measuring equipment, (VISC adjustment tool for DNW-A28P) and video monitor as shown above.



2. Start up the maintenance mode. (Refer to Section 9-1-1.)
3. Select “A37 : TBC VR.”
4. Press the SET button on the front panel to enable the tape operation.
5. Set the composite waveform/vector monitor as follows : SCH mode, INPUT : CH-A, EXT REF

1. VISC phase adjustment

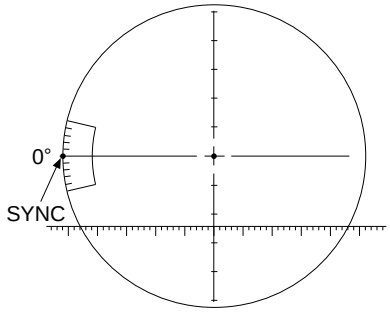
1. Play back the H sweep signal (with VISC) portion (28 : 00 to 30 : 00) of the alignment tape CR5-1B or CR5-1B PS. (DNW-A28 : CR5-1B, DNW-A28P : CR5-1B PS)

   Note

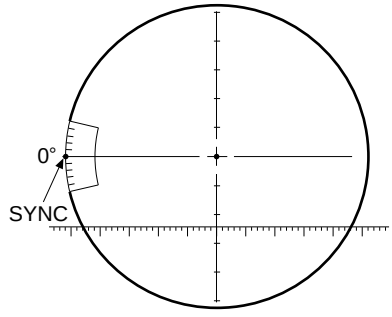
   Continue playing back the alignment tape from here to step 2 (3).

   Be sure to perform up to step 2 (2) continuously without interval.
2. Set “CAPSTAN LOCK” of the sub menu (General setting page) as follows, then return it to 2FD after two seconds. (Regarding the sub menu setting, refer to Section 2 of operation manual.)
   DNW-A28 : 4FD
   DNW-A28P : 8FD
3. Adjust the SYNC phase to 0 degree with PHASE knob of the composite waveform/vector monitor.

DNW-A28



DNW-A28P

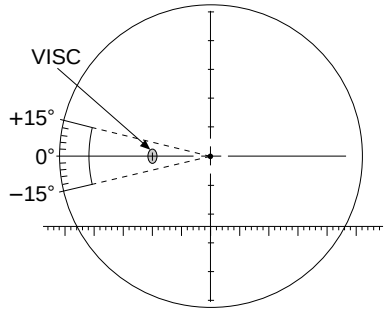


4. Set the composite waveform/vector monitor as follows :
   DNW-A28 : VECTOR mode, Line select : 11, EXT REF
   DNW-A28P : VECTOR mode, Line select : 8, EXT REF
5. Adjust the center position of VISC (beam spot) to 0 degree with PHASE knob of the composite waveform/ vector monitor.
6. Set “CAPSTAN LOCK” of the sub menu (General setting page) as follows :
   DNW-A28 : 4FD
   DNW-A28P : 8FD
7. Adjust the center position of VISC (beam spot) so as to satisfy the specification.
   Adjustment point : ⊘RV1801/DM-114 (⁎C-6)
   Specifications : Center of beam spot : 0 ±5˚

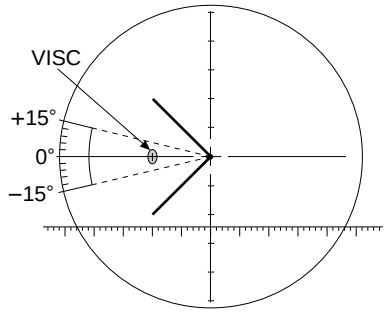
   Note

   If the specification is not satisfied, perform up to step 2 (2) after setting RV1801 to the mechanical center.

DNW-A28



DNW-A28P



2. Additional adjustment if the VISC phase cannot be adjusted by step 1 (RV1801)

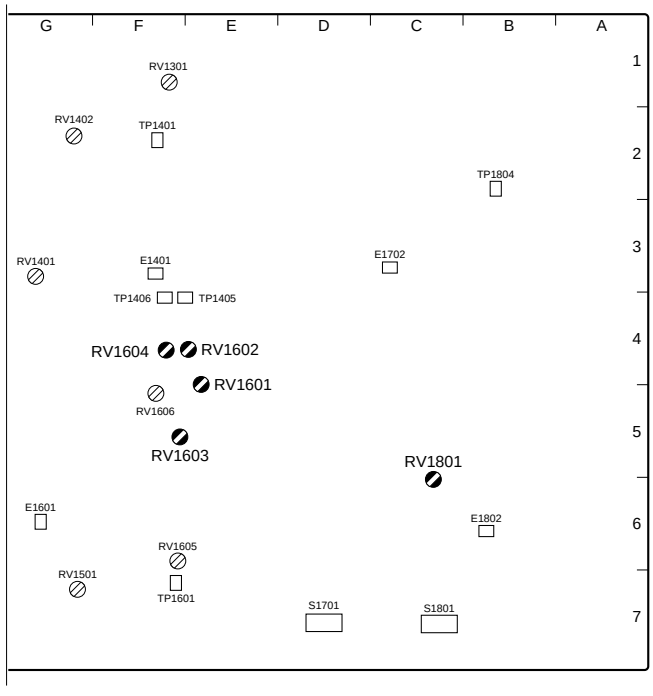
(1) To activate the maintenance mode, press the MENU button once.
(2) Change the data value of “VISC PHASE” within ±1 so that the center of VISC (beam spot) moves closer to 0 degree.
(3) Press the SET button on the front panel to enable the tape operation.
(4) Repeat step 7.
(5) Stop the playback of the alignment tape CR5-1B/CR5-1B PS, and eject it.
(6) To activate the maintenance mode, press the MENU button once.
(7) To exit from A37 : TBC VR, press the MENU button once again.

3. Saving data

Note

Be sure to save data only when VISC PHASE’s data value of A37 : TBC VR is changed.

1. To exit from A37 : TBC VR, press the MENU button once.
2. Select A3F : NV-RAM CONTROL of the maintenance mode, then execute “SAVE ALL ADJUST DATA.”
3. Check that the message “Save Complete” is displayed on the video monitor.
4. To exit from A3F : NV-RAM CONTROL, press the MENU button once.
5. To exit from the maintenance mode, press the MENU button three times.



DM-114 Board (B Side)

9-10. Timecode Adjustment

9-10-1. LTC Erasure Frequency Adjustment

Measuring equipment : Frequency counter and Oscilloscope

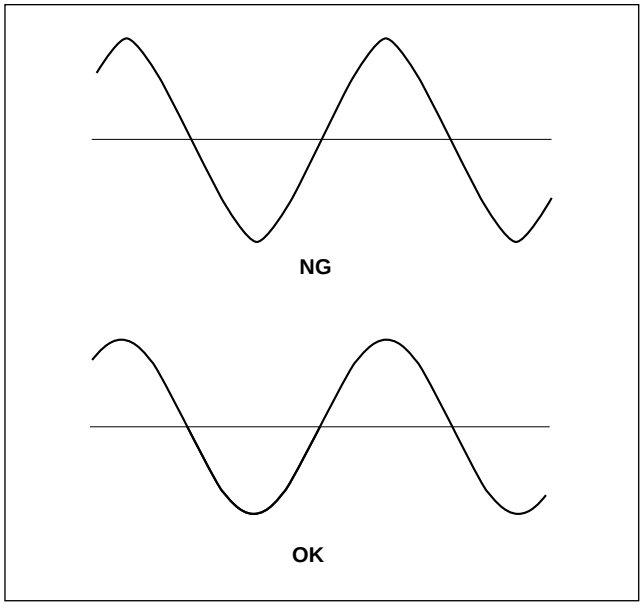
Preparation :

1. Disconnect the DM-114/DM-114P board. (Refer to Section 1-6-2.)

Adjustment :

1. Connect the frequency counter to TP951/SV-194A (A-2).
   GND : E951/SV-194A (A-2)
2. Insert a blank SX tape, then put into the recording mode.
   Adjustment point : ⊘LV950/SV-194A (A-2)
   Specification : 40 ±2 kHz

3. Disconnect the frequency counter and connect the oscilloscope to the same test point.
   Specification : No distortion is observed on the waveform.



9-10-2. LTC PB Level Check

Measuring equipment : Oscilloscope

(1) Connect the oscilloscope to TP900/SV-194A (A-4).
GND : E900/SV-194A (A-3)

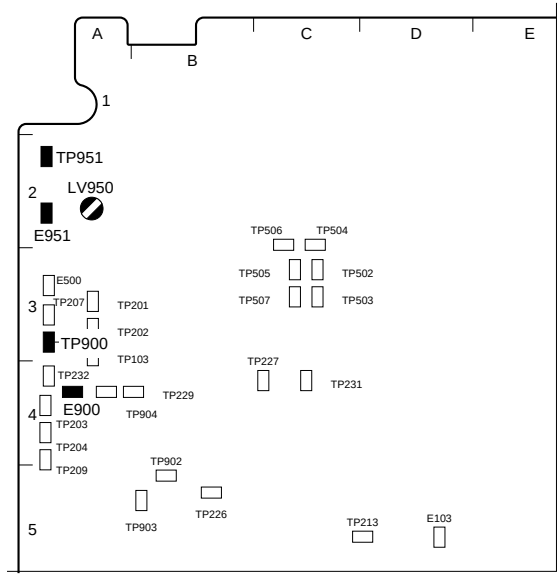
(2) Play back the alignment tape SR5-1/SR5-1P and make sure that the waveform level is within specification.
Specification : 700 mVp-p or more

(3) Rewind the tape in the REW mode, then rewind at −5 times and at −1/5 time normal speed in the shuttle mode. Make sure that the waveform level is within specification in every mode.
Specification : 700 mVp-p or more

If the above specifications are not met, perform the tape path adjustment again.

Note after Finishing Adjustment

Install the DM-114/114P board removed in section 9-10-1.



SV-194A Board (A Side)

Appendix A
Setting Check Sheet

It is recommended to make a photocopy of check sheets given in this appendix and write down setup conditions such as switches' setting in the check sheets according to application.
If setup conditions are noted, the settings can be returned easily to its original condition after being changed temporarily (when operating condition changes and so on).
And when the unit is to be checked, maintained or repaired, please attach the filled-in check sheets to the unit.
If system combinations are frequently changed according to use, it is convenient to prepare check sheets for every system. Make use of the check sheets to avoid mistakes.

Model name : DNW-_____ Serial No. : _____

- Firmware

  SYS1 ROM version : _____
  SYS2 ROM version : _____
  SV1 ROM version : _____
  KY0 ROM version : _____
  SW0 ROM version : _____

- Hours meter

  Write down readings of hours meter when checking, servicing or maintaining the unit.

ITEM	Date	Hours meter
H01 : OPERATION HOURS	/	
H02 : DRUM RUNNING HOURS	/	
H03 : TAPE RUNNING HOURS	/	
H04 : THREADING COUNTER	/	
H12 : DRUM RUNNING HOURS(Resettable)	/	
H13 : TAPE RUNNING HOURS(Resettable)	/	
H14 : THREADING COUNTER(Resettable)	/	

Connector panel

Switch		Factory setting	Setting		
Analog audio input level	CH1/3	+4 dBu	☐ –60	☐ 0	☐ +4
	CH2/4	+4 dBu	☐ –60	☐ 0	☐ +4
48V	CH1/3	OFF	☐ OFF	☐ ON	
(at –60 dBu input level setting)	CH2/4	OFF	☐ OFF	☐ ON	
Reference video input 75 Ω		ON	☐ ON	☐ OFF	
Composite video input 75 Ω		ON	☐ ON	☐ OFF	

Front panel

Switch	Factory setting	Setting		
REC/INHIBIT	OFF	☐ ON	☐ OFF	
LOCAL/REMOTE	LOCAL	☐ LOCAL	☐ REMOTE	
TC GENERATOR	INT	☐ INT	☐ EXT	
	PRESET	☐ PRESET	☐ REGEN	
	F-RUN	☐ F-RUN	☐ R-RUN	
PB /PB/EE	PB	☐ PB	☐ PB/EE	
METER	CH-1/2	☐ CH-1/2	☐ CH-3/4	
MAIN AUDIO	PRESET	☐ PRESET	☐ VARIABLE	
SUB AUDIO	PRESET	☐ PRESET	☐ VARIABLE	
MONITOR	1/2	☐ 1/2	☐ MIX	☐ 2/1

Internal Slit-lands

Note Never change setting of factory-use Slit-lands.

Board	Name	Channel	Ref. No.	Factory setting	Setting
AU-249	Audio input headroom	CH-1	SL101 SL102	OPEN (20 dB) OPEN	
		CH-2	SL201 SL202	OPEN (20 dB) OPEN	
	Audio output headroom	CH-1	SL301 SL302	OPEN (20 dB) OPEN	
		CH-2	SL401 SL402	OPEN (20 dB) OPEN	
	Monitor output headroom	L	SL501 SL502	OPEN (20 dB) OPEN	
		R	SL601 SL602	OPEN (20 dB) OPEN	
RE-150	Power select		SL1	OPEN	
HP-100	Factory use		SL1 SL2	OPEN OPEN	– –

Internal Switches

Note Never change setting of factory-use switches.

Board	Switch No. :		Name		Factory setting	Setting
AU-249	S1	1-4 :	Factory use		OFF (OPEN)	–
DM-114/	S101 :		Y EQ TEST		NORMAL POSITION	–
DM-114P	S301 :		C EQ TEST		NORMAL POSITION	–
	S501 :		Factory use		ON	–
	S901	1 :	RF adjusting switch		OFF (OPEN)	–
		2 :	Factory use		OFF (OPEN)	–
		3 :	AGC OFF		OFF (OPEN)	–
		4 :	Factory use		OFF (OPEN)	–
	S1701	1 :	Y MUTE		OFF (OPEN)	
		2-3 :	Factory use		OFF (OPEN)	–
		4 :	C MUTE		OFF (OPEN)	
		5 :	COMB		OFF (OPEN)	
		6-8 :	Factory use		OFF (OPEN)	–
	S1801	1 :	D CLP OFF		OFF (OPEN)	
		2-4 :	Factory use		OFF (OPEN)	–
PA-218	S500 :		CH1 HEAD TUNE Switch		Used during adjustment	–
	S600 :		CH2 HEAD TUNE Switch		Used during adjustment	–
SV-194A	S100	1*1 :	CASSETTE COMPARTMENT LOCK		OFF (OPEN)	–
		2*2 :	SERVO ERR NOT DET		OFF (OPEN)	–
		3 :	Factory use		OFF (OPEN)	–
		4 :	AUTO-TRACKING OFF		OFF (OPEN)	–
		5-6 :	Factory use		OFF (OPEN)	–
SY-259B	S201	1 :	EXTENDED MENU		OFF (OPEN)	
		2 :	MAINTE MODE ACCESS		OFF (OPEN)	
		3-8 :	Factory use		OFF (OPEN)	–
	S202	1-2 :	Factory use		OFF (OPEN)	–
		Never change the settings of S202 for bits 3 to 8 since each is set according to the characteristics of the unit				
		3-6 :	MODEL ID	3 :	OFF (OPEN)	
				4 :	ON (CLOSE)	
				5 :	OFF (OPEN)	–
				6 :	OFF (OPEN)	–
		7 :	J/UC		ON (CLOSE)	–
		8 :	525/625	DNW-A28 :	OFF (OPEN)	–
				DNW-A28P :	ON (CLOSE)	–
SY-260	S201	1 :	PINCH ON OFF		ON	
		2-8 :	Factory use		OFF (OPEN)	–
SW-21	S10	1 :	BATT ID		OFF (OPEN)	
		2 :	Factory use		OFF (OPEN)	

*1, *2 : Never change setting of the switches S101-1 and S101-2.

For 525/60 System

The sub menu and the setup menu can store the data for 525/60 and 625/50 systems independently. Therefore, fill out the check sheets for each system, selecting system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 1-19-3.)

525/60 system : Pages A-4 to A-10
625/50 system : Pages A-11 to A-18

Some menu items in the check sheets may be added or changed depending on the ROM version. In this case, please write down notes in the margin.

Sub menu

HOME page

ITEM	Factory setting	Setting
AUDIO SETTING BANK	AU-1	
TIME CODE READER	AUTO	
VITC	VITC ON	
VIDEO INPUT	SDI	

Audio setting page

ITEM		Factory setting	AU-1	AU- 2	AU- 3	AU-4
AU SG		OFF				
AGC		OFF				
LIMITER		OFF				
AUDIO INPUT IN-1		SDI-1				
AUDIO INPUT IN-2		SDI-2				
AUDIO INPUT IN-3		SDI-3				
AUDIO INPUT IN-4		SDI-4				
MIX/SWAP	CH-1	IN-1				
	CH-2	IN-2				
	CH-3	IN-3				
	CH-4	IN-4				
EMPH		OFF				
DOLBY		OFF				
LINE OUT		CH-1/2				
MONITOR LEVEL		FIX				
MONITOR CH	L	CH-1				
	R	CH-2				
MAIN VR		PB				

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Video setting page

ITEM		Factory setting	Setting
VIDEO	CONFI	OFF	
	PRESET/ VAR	PRE	
	PREREAD	OFF	
	VIDEO IN	80	
	VIN TRG	OFF	
	OUT REF	REF	
PROCESS CONTROL		PANEL	
(When the above item is set to	Y/C DLY	800 PRESET	
PANEL)	SYNC PH	80	
	SC PH	200	
	SG	OFF	
	AUD SG	SILNC	
	VID SG	BB	

General setting page

ITEM	Factory setting	Setting
SUPER	ALL	
BAT-END	10.5	
BAT-NE	11.0	
CAPSTAN LOCK	4F	
KEY INH	OFF	
DF	DF	
VFD BRIT	LOW	

Set up menu

Note When Banks 1 to 4 menu is recalled, the current menu will be overwritten.
Be sure to write down the current menu settings first, before recalling Banks 1 to 4. And then, write down the Banks' settings.

Main menu

ITEM-000 series : Operational parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
001 : PREROLL TIME	5S					
002 : CHARACTER H-POSITION	14					
003 : CHARACTER V-POSITION	56					
004 : SYNCHRONIZE	ON					
005 : DISPLAY INFORMATION SELECT	T&STA					
006 : LOCAL FUNCTION ENABLE	ST&EJ					
007 : TAPE TIMER DISPLAY	+−12H					
008 : MONITORING SELECTION FOR VTR-TO-VTR EDIT	MANU					
009 : CHARACTER TYPE	WHITE					
011 : CHARACTER V-SIZE	×1					
013*1 : 525/625 SYSTEM SELECT	OFF	–	–	–	–	–
014 : SEQUENTIAL RECORD MODE	OFF					
017 : CHARACTOR PRESET	OFF					

∗1 : ITEM-013 has no relation with Banks.

ITEM-B00 series : Menu bank parameter

It is unnecessary to write down the setting for this series.
Each item of B00 series is set to OFF in the normal state. Set to ON only when executing each item.
After execution, each item returns to OFF automatically.

Extended menu

ITEM-100 series : Operational panel parameter

ITEM			Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
101 :	SELECTION FOR SEARCH DIAL ENABLE		DIAL					
104 :	AUDIO MUTING TIME		OFF					
105 :	REFERENCE SYSTEM ALARM		OFF					
106 :	CAPSTAN LOCK		SW					
107 :	REC INHIBIT LAMP FLASHING		OFF					
108 :	AUTO EE SELECT		S/F/R					
109 :	FORCED EE WHEN TAPE UNTHREAD		ON					
118 :	KEY INHIBIT SWITCH EFFECTIVE AREA							
	SUB-ITEM	REMOTE SELECT	DIS					
		CONTROL PANEL	DIS					
119 :	VARIABLE SPEED LIMIT IN KEY PANEL CONTROL		OFF					
120 :	CTL LOCK IN VAR/SHTL		OFF					
122 :	AUTO EE WITH ANALOG TAPE		DIS					

ITEM-200 series : Remote interface parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
201 :	PARA RUN	DIS					

ITEM-300 series : Editing parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
301 :	VAR SPEED RANGE FOR SYNCHRONIZATION	~1.5					
302 :	CAPSTAN RE-LOCKING DIRECTION	DECEL					
305 :	SYNC GRADE	ACCUR					
306 :	DMC INITIAL SPEED	MANUAL					
307 :	AUTO-DELETION FOR INCONSISTENT DATA	MANU					
308 :	SELECTION OF STD/NON-STD FOR COMPOSITE VIDEO IN	AUTO					
309 :	SERVO/AV REFERENCE SELECT	AUTO1					
310 :	REC INHIBIT	ALL					
311 :	ANALOG AUDIO EDIT PRESET REPLACE FOR CH1	ANALOG CH1					
312 :	ANALOG AUDIO EDIT PRESET REPLACE FOR CH2	ANALOG CH2					
313 :	ANALOG AUDIO EDIT PRESET REPLACE FOR CH3	NO DEFINITION					
314 :	ANALOG AUDIO EDIT PRESET REPLACE FOR CH4	NO DEFINITION					
317 :	AUDIO EDIT MODE	CROSS FADE					
318 :	EDIT RETRY	ON					
319 :	PREREAD SELECT	A/V					
320 :	DIGITAL AUDIO PB PROCESS ON EDIT POINT	FADE					
326 :	AUTOMATIC IN ENTRY AFTER AUTO EDIT	OFF					

ITEM-400 series : Preroll parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
401 : FUNCTION MODE AFTER CUE-UP	STOP					
402 : TIME REFERENCE FOR PREROLL	CTL					
403 : AUTOMATIC PREROLL REFERENCE ENTRY	DIS					

ITEM-500 series : Tape protection parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
501 : STILL TIMER	8M					
502 : TAPE PROTECTION MODE FROM SEARCH	STEP					

ITEM-600 series : Time code generator parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
601 : VITC POSITION SEL-1	16H					
602 : VITC POSITION SEL-2	18H					
603*1 : ID CODE PRESET	OFF	–	–	–	–	–
604 : ID CODE SW	OFF					
605 : TCG REGEN MODE	TC&UB					
606 : TC OUTPUT SIGNAL IN REGEN MODE	TAPE					
607 : U-BIT BINARY GROUP FLAG	000					
608 : PHASE CORRECTION	OFF					
609 : TCG CF FLAG	OFF					
610 : REGEN CONTROL MODE	AS&IN					

*1 : ITEM-603 has no relation with Banks.

ITEM-700 series : Video control parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
701 : SELECTION OF VIDEO DELAY/SYNC DELAY		VIDEO					
703 : BLANK LINE SELECT							
SUB-ITEM	0 : All line	–––					
	12 : 12 line	BLANK					
	13 : 13 line	BLANK					
	14 : 14 line	BLANK					
	15 : 15 line	BLANK					
	16 : 16 line	BLANK					
	17 : 17 line	BLANK					
	18 : 18 line	BLANK					
	19 : 19 line	BLANK					
	20 : 20 line	BLANK					
	21 : 21 line	BLANK					
704 : DECODE Y/C SEP MODE							
SUB-ITEM	12 : 12 line	B&W					
	13 : 13 line	B&W					
	14 : 14 line	B&W					
	15 : 15 line	B&W					
	16 : 16 line	B&W					
	17 : 17 line	B&W					
	18 : 18 line	B&W					
	19 : 19 line	B&W					
	20 : 20 line	B&W					
	21 : 21 line	COMB					
	22 : 22 line	COMB					
705 : EDGE SUBCARRIER REDUCER MODE		AUTO					
706 : VERTICAL BLANKING V SHIFT		ON					
707 : FORCED VERTICAL INTERPOLATION OFF		AUTO					
712 : VIDEO PROCESS ON CAP LOCK 2FIELD		OFF					
713 : VIDEO SETUP REFERENCE LEVEL							
SUB-ITEM	0 : MASTER LEVEL	7.5%					
	1 : INPUT LEVEL	MSTER					
	2 : INPUT VBLK CNT	THROU					
	3 : BETACAM PB LEVEL	MSTER					
	4 : OUTPUT LEVEL	MSTER					
714 : VIDEO ADJUST RANGE		–3 ~ +3					
715 : VIDEO GAIN CONTROL		800H					
716 : CHROMA GAIN CONTROL		800H					
717 : CHROMA PHASE CONTROL		80H					
718 : SETUP LEVEL		110H					
719 : SYSTEM PHASE SYNC		80H					
720 : SYSTEM PHASE SC		0H					

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
721 : Y/C DELAY		800H					
723 : INPUT VIDEO BLACK							
SUB-ITEM	0 : All line	–––					
	12 : 12 line	BLANK					
	13 : 13 line	BLANK					
	14 : 14 line	BLANK					
	15 : 15 line	BLANK					
	16 : 16 line	BLANK					
	17 : 17 line	BLANK					
	18 : 18 line	BLANK					
	19 : 19 line	BLANK					
	20 : 20 line	BLANK					
726 : H BLANKING WIDTH		WIDE					
727 : VIDEO EDIT PREVIEW SWITCHER		INT					
728 : OUTPUT SCH PHASE SETTING		800H					
730 : PICTURE SHIFT		OFF					

ITEM-800 series : Audio control parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
802 : DIGITAL AUDIO MUTE IN SHUTTLE MODE	OFF					
803 : DIGITAL AUDIO FADE TIME	10ms					
805 : AUDIO MONITOR OUTPUT MIXING	RMS					
807 : AUDIO OUTPUT PHASE	80					
810 : AUDIO EDIT PREVIEW SWITCHER	INT					

ITEM-900 series : Digital process parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
911 : NO COMPRESSION LINE	OFF					
912 : SEQUENTIAL RECORD INPUT SIGNAL	PARALLEL					

ITEM-F00 series: Adjustment use only

It is unnecessary to reset for normal operation.
Do not change setting of each item from its factory-set position.

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
F01 : AUDIO NR IN SP MODE	ON					
F02 : EMERGENCY TAPE PROTECTION	ENA					
F13 : TRACKING CONTROL VIA SEARCH DIAL	OFF					
F16 : DEVICE TYPE MODIFY	0					
F21 : PROCESS CONT VR	OFF					

For 625/50 System

The sub menu and the setup menu can store the data for 525/60 and 625/50 systems independently. Then fill out the check sheets for each system, selecting system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 1-19-3.)

525/60 system : Pages A-4 to A-10
625/50 system : Pages A-11 to A-18

Some menu items in the check sheets may be added or changed depending on the ROM version. In this case, please write down notes in the margin.

Sub menu

Home page

ITEM		Factory setting	Setting
AUDIO SETTING BANK		AU-1	
TIME CODE READER		AUTO	
VITC		VITC ON	
VIDEO INPUT		SDI	

Audio setting page

ITEM		Factory setting	AU-1	AU- 2	AU- 3	AU-4
AU SG		OFF				
AGC		OFF				
LIMITER		OFF				
AUDIO INPUT IN-1		SDI-1				
AUDIO INPUT IN-2		SDI-2				
AUDIO INPUT IN-3		SDI-3				
AUDIO INPUT IN-4		SDI-4				
MIX/SWAP	CH-1	IN-1				
	CH-2	IN-2				
	CH-3	IN-3				
	CH-4	IN-4				
EMPH		OFF				
DOLBY		OFF				
LINE OUT		CH-1/2				
MONITOR LEVEL		FIX				
MONITOR CH	L	CH-1				
	R	CH-2				
MAIN VR		PB				

Video setting page

ITEM		Factory setting	Setting
VIDEO	CONFI	OFF	
	PRESET/VAR	PRE	
	PREREAD	OFF	
	VIDEO IN	80	
	VIN TRG	OFF	
	OUT REF	REF	
PROCESS CONTROL		PANEL	
(When the above item is set to	Y/C DLY	800 PRESET	
PANEL)	SYNC PH	80	
	SC PH	200	
	SG	OFF	
	AUD SG	SILNC	
	VID SG	BB	

General setting page

ITEM	Factory setting	Setting
SUPER	ALL	
BAT-END	10.5	
BAT-NE	11.0	
CAPSTAN LOCK	4F	
KEY INH	OFF	
VFD BRIT	LOW	

Setup menu

Note When Banks 1 to 4 menu is recalled, the current menu will be overwritten.
Be sure to write down the current menu settings first, before recalling Banks 1 to 4. And then, write down the Banks' settings.

Main menu

ITEM-000 series : Operational parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
001 :	PREROLL TIME	5S					
002 :	CHARACTER H-POSITION	12					
003 :	CHARACTER V-POSITION	6A					
004 :	SYNCHRONIZE	ON					
005 :	DISPLAY INFORMATION SELECT	T&STA					
006 :	LOCAL FUNCTION ENABLE	ST&EJ					
007 :	TAPE TIMER DISPLAY	+−12H					
008 :	MONITORING SELECTION FOR VTR-TO-VTR EDIT	MANU					
009 :	CHARACTER TYPE	WHITE					
011 :	CHARACTER V-SIZE	×1					
013*1 :	525/625 SYSTEM SELECT	OFF	–	–	–	–	–
014 :	SEQUENTIAL RECORD MODE	OFF					
017 :	CHARACTER PRESET	OFF					

∗1 : ITEM-013 has no relation with Banks.

ITEM-B00 series : Menu bank parameter

It is unnecessary to write down the setting for this series.
Each item of B00 series is set to OFF in the normal state. Set to ON only when executing each item.
After execution, each item returns to OFF automatically.

Extended menu

ITEM-100 series : Operational panel parameter

ITEM			Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
101 :	SELECTION FOR SEARCH DIAL ENABLE		DIAL					
104 :	AUDIO MUTING TIME		OFF					
105 :	REFERENCE SYSTEM ALARM		OFF					
106 :	CAPSTAN LOCK		SW					
107 :	REC INHIBIT LAMP FLASHING		OFF					
108 :	AUTO EE SELECT		S/F/R					
109 :	FORCED EE WHEN TAPE UNTHREAD		ON					
118 :	KEY INHIBIT SWITCH EFFECTIVE AREA							
	SUB-ITEM	REMOTE SELECT	DIS					
		CONTROL PANEL	DIS					
119 :	VARIABLE SPEED LIMIT IN KEY PANEL CONTROL		OFF					
120 :	CTL LOCK IN VAR/SHTL		OFF					
122 :	AUTO EE WITH ANALOG TAPE		DIS					

ITEM-200 series : Remote interface parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
201 :	PARA RUN	DIS					
202 :	CF FLAG REPLY	8F					

ITEM-300 series : Editing parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
301 :	VAR SPEED RANGE FOR SYNCHRONIZATION	~1.5					
302 :	CAPSTAN RE-LOCKING DIRECTION	ACCEL					
305 :	SYNC GRADE	ACCUR					
306 :	DMC INITIAL SPEED	MANUAL					
307 :	AUTO-DELETION FOR INCONSISTENT DATA	MANU					
308 :	SELECTION OF STD/NON-STD FOR COMPOSITE VIDEO IN	AUTO					
309 :	SERVO REFERENCE SELECT	AUTO1					
310 :	REC INHIBIT	ALL					
311 :	ANALOG AUDIO EDIT PRESET REPLACE FOR CH1	ANALOG CH1					
312 :	ANALOG AUDIO EDIT PRESET REPLACE FOR CH2	ANALOG CH2					
313 :	ANALOG AUDIO EDIT PRESET REPLACE FOR CH3	NO DEFINITION					
314 :	ANALOG AUDIO EDIT PRESET REPLACE FOR CH4	NO DEFINITION					
317 :	AUDIO EDIT MODE	CROSS FADE					
318 :	EDIT RETRY	ON					
319 :	PREREAD SELECT	A/V					
320 :	DIGITAL AUDIO PB PROCESS ON EDIT POINT	FADE					
326 :	AUTOMATIC IN ENTRY AFTER AUTO EDIT	OFF					

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ITEM-400 series : Preroll parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
401 : FUNCTION MODE AFTER CUE-UP	STOP					
402 : TIME REFERENCE FOR PREROLL	CTL					
403 : AUTOMATIC PREROLL REFERENCE ENTRY	DIS					

ITEM-500 series : Tape protection parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
501 : STILL TIMER	8M					
502 : TAPE PROTECTION MODE FROM SEARCH	STEP					

ITEM-600 series : Time code generator parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
601 : VITC POSITION SEL-1	19H					
602 : VITC POSITION SEL-2	21H					
603*1 : ID CODE PRESET	OFF	–	–	–	–	–
604 : ID CODE SW	OFF					
605 : TCG REGEN MODE	TC&UB					
606 : TC OUTPUT SIGNAL IN REGEN MODE	TAPE					
607 : U-BIT BINARY GROUP FLAG	000					
608 : PHASE CORRECTION	OFF					
609 : TCG CF FLAG	OFF					
610 : REGEN CONTROL MODE	AS&IN					

*1 : ITEM-603 has no relation with Banks.

ITEM-700 series : Video control parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
701 : SELECTION OF VIDEO DELAY/SYNC DELAY		VIDEO					
703 : BLANK LINE SELECT							
SUB-ITEM	0 : All line	–––					
	9 : 9,322 line	BLANK					
	10 : 10,323 line	BLANK					
	11 : 11,324 line	BLANK					
	12 : 12,325 line	BLANK					
	13 : 13,326 line	BLANK					
	14 : 14,327 line	BLANK					
	15 : 15,328 line	BLANK					
	16 : 16,329 line	BLANK					
	17 : 17,330 line	BLANK					
	18 : 18,331 line	BLANK					
	19 : 19,332 line	BLANK					
	20 : 20,333 line	BLANK					
	21 : 21,334 line	BLANK					
	22 : 22,335 line	BLANK					
	23 : 23 line	HALF					
704 : DECODE Y/C SEP MODE							
SUB-ITEM	9 : 9,322 line	B&W					
	10 : 10,323 line	B&W					
	11 : 11,324 line	B&W					
	12 : 12,325 line	B&W					
	13 : 13,326 line	B&W					
	14 : 14,327 line	B&W					
	15 : 15,328 line	B&W					
	16 : 16,329 line	B&W					
	17 : 17,330 line	B&W					
	18 : 18,331 line	B&W					
	19 : 19,332 line	B&W					
	20 : 20,333 line	B&W					
	21 : 21,334 line	B&W					
	22 : 22,335 line	B&W					
705 : EDGE SUBCARRIER REDUCER MODE		AUTO					
706 : VERTICAL BLANKING V SHIFT		ON					
707 : FORCED VERTICAL INTERPOLATION OFF		AUTO					
712 : VIDEO PROCESS ON CAP LOCK 2FIELD		OFF					

ITEM			Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
714 :	VIDEO ADJUST RANGE		−3 ~ +3					
715 :	VIDEO GAIN CONTROL		800H					
716 :	CHROMA GAIN CONTROL		800H					
717 :	CHROMA PHASE CONTROL		80H					
718 :	SETUP LEVEL		110H					
719 :	SYSTEM PHASE SYNC		80H					
720 :	SYSTEM PHASE SC		0H					
721 :	Y/C DELAY		800H					
723 :	INPUT VIDEO BLACK							
	SUB-ITEM	0 : All line	−−−					
		9 : 9,322 line	THROU					
		10 : 10,323 line	THROU					
		11 : 11,324 line	THROU					
		12 : 12,325 line	THROU					
		13 : 13,326 line	THROU					
		14 : 14,327 line	THROU					
		15 : 15,328 line	THROU					
		16 : 16,329 line	THROU					
		17 : 17,330 line	THROU					
		18 : 18,331 line	THROU					
		19 : 19,332 line	THROU					
		20 : 20,333 line	THROU					
		21 : 21,334 line	THROU					
		22 : 22,335 line	THROU					
726 :	H BLANKING WIDTH		WIDE					
727 :	VIDEO EDIT PREVIEW SWITCHER		INT					
728 :	OUTPUT SCH PHASE SETTING		800H					
730 :	PICTURE SHIFT		OFF					

ITEM-800 series : Audio control parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
802 : DIGITAL AUDIO MUTE IN SHUTTLE MODE	OFF					
803 : DIGITAL AUDIO FADE TIME	10ms					
805 : AUDIO MONITOR OUTPUT MIXING	RMS					
807 : AUDIO OUTPUT PHASE	80					
810 : AUDIO EDIT PREVIEW SWITCHER	INT					

ITEM-900 series : Digital process parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
911 : NO COMPRESSION LINE	OFF					
912 : SEQUENTIAL RECORD INPUT SIGNAL	PARALLEL					

ITEM-F00 series : Adjustment use only

It is unnecessary to reset for normal operation.
Do not change setting of each item from its factory-set position.

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
F01 : AUDIO NR IN SP MODE	ON					
F02 : EMERGENCY TAPE PROTECTION	ENA					
F13 : TRACKING CONTROL VIA SEARCH DIAL	OFF					
F16 : DEVICE TYPE MODIFY	0					
F21 : PROCESS CONT VR	OFF					

DNW-A28 (SY)
DNW-A28P (SY) E
9-967-866-01

Sony Corporation
Broadcasting & Professional Systems Company

Printed in Japan
1999. 10 08
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